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ECONOMIC CAPABILITIES OF THE SOVIET BLOC
TO SUPPORT A GENERAL WAR.

This document is a Working Paper. It does not have the concurrence of any of the agencies participating in the study. Its submission is for the purpose of criticism. Such criticisms should be addressed to CIA, 2430 E St., N.W., Attn: [REDACTED]

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Economic Intelligence Committee
Working Group on
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PART I

SUMMARY AND CONCLUSIONS

The Summary and Conclusions of this Report cannot be written until Parts V and VI have been completed. These two parts cannot be written until estimates of hot war military demand have been made.

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PART II

THE PROBLEM AND ITS SETTING

A. THE PROBLEM

The problem to which the study is addressed is that of estimating the economic capabilities of the Soviet Bloc to support a general war between 1 July 1952 and 1 July 1953.

By economic capabilities is meant the ability of the economy of the Soviet Bloc to produce, or otherwise make available, economic resources sufficient to satisfy the requirements of a specific time and activity situation. Those requirements include not only the direct requirement of the armed forces and armaments industry but also the requirements of industries supporting the military establishment and the production of military end items.

The Soviet Bloc includes for purposes of this analysis, the USSR, the European Satellites, and China. The European Satellites are Albania, Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, and Rumania.

This Report utilizes economic intelligence estimates of the availability, production, allocation, inventory, imports, exports, and consumption of selected Soviet Bloc resources during the period 1 July 1952 to 1 July 1953.

B. ASSUMPTIONS

The basic sets of assumptions considered in this Report, postulate for the same time period and for given Soviet Bloc

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area and resources, alternative sets of demands on the economy of the Soviet Bloc.

First, it is assumed that the cold war will continue through the period 1 July 1952 to 1 July 1953. Included in this assumption is the preclusion of a build-up period. It is assumed that there is no break with the past in terms of production trends, consumption, and allocation of resources. Inventories of military end items and of economic resources are assumed to accumulate at rates not influenced by the imminence of war, although the Korean war is assumed to continue without intensification.

The alternative set of assumptions provide that the Soviet Bloc is engaged in a general war during the period 1 July 1952 to 1 July 1953. However, it is arbitrarily assumed that there is no damage to the Soviet Bloc from air bombardment. The nature of the general war, the locale, the type and amount of opposition, damage to the Bloc, beginning and ending dates, and materiel and equipment requirements, as well as resource requirements are specified in Part V.

In connection with the general war, it is assumed that the inventory of military end items remains constant, i.e., that there is equivalence between military consumption in the field and the production of military end items. While this assumption does not invariably hold, for purposes of this analysis, it represents a realistic approximation. In fact, military

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inventories are reduced, orders are placed and the inventory built up again; inventories fluctuate widely and in a complicated manner depending on the requirements of the campaigns. Production increases, slowly at first, but then more rapidly, and may lag the initial inventory depletion by as much as a year.

However, the fact that military consumption and its impact on the economy are not simultaneous does not necessarily invalidate the assumption that they are simultaneous for purposes of determining the economic capabilities of the Bloc in undertaking general war. The impact will be felt and resources will be required, even though the initial military actions are undertaken with inventory.

C. THE REPORT

This report consists of six parts. The first is a brief summary and conclusion; the second sets the stage by briefly discussing the problem, assumptions, data, sources and documentation, validity of estimates, and method. The third part presents the analytical framework. The main empirical effort is to be found in Parts IV and V. In the fourth part the structure of Soviet Bloc economic activity is examined both overall and sector by sector. The fifth part outlines the postulated war and stipulates the requirements of this war on the economy of the Soviet Bloc, including a sector by sector tabulation of hot war requirements. Furthermore, the implications

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of the new set of military requirements, is analyzed by matching these alternative demands with the capabilities of the Bloc economy. Part VI, summarizes these implications, taking particular account of the inter-industrial relationships, and indicates the sectors of relative strength and weakness in the Soviet Bloc.

The statement of the general war and the requirements so generated, has not yet been undertaken. Therefore, the economic analysis which would make use of these data (Part V) as well as the estimate of economic capabilities which would follow from such analysis (Parts I and VI) cannot be completed.

This rump draft consists only of Part II (The Problem and Its Setting), Part III (The Analytical Framework), and Part IV (Soviet Bloc Cold War Economic Position). These three sections cannot provide an estimate of the economic capabilities of the Soviet Bloc to support a general war. They are merely an analytical approach and a description of the Soviet Bloc economic system. However, there is useful and important economic intelligence which can be used to support judgments about Soviet Bloc economic capabilities. The genuine analysis of economic capabilities, however, must await the development of information on hot war military demand.

When this further information has been produced and analyzed, Parts I, V, and VI will be written and such revisions and modifications as appear necessary will be made in the other parts.

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It is hoped that this draft will be subjected to careful, constructive criticism by the intelligence community. Such criticism might include:

1. Refinement of quantitative estimates.
2. Contribution of quantitative estimates which would broaden coverage.
3. Suggested improvements in the techniques for deriving inter-industry data.
4. Suggested applications of the analytical framework to problems of economic capabilities and vulnerabilities.

This draft does not have the concurrence of any member of the Working Group and does not establish an intelligence position for any intelligence unit.

D. THE DATA

The data consists of estimates under cold war conditions of production, imports and exports, inventories (or stockpiles), use patterns, and factor inputs, for the period 1 July 1952 to 1 July 1953 for about forty important sectors of the Soviet Bloc.

The total output data in this draft are the best estimates as of April 1952. The data may not exactly conform to more recent estimates. For example, some of the total output figures are at variance with current estimates by as much as 19 percent (e.g., copper and aluminum).

Estimates of Soviet Bloc future production are in a constant process of revision. However, the study of interindustrial relationships makes it necessary to freeze the output totals at an early stage in order to examine the interindustrial structure in detail.

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For example, one change in the output of an industry requires that the entire system be altered; the use pattern of that industry must be revised, which, in turn, alters the input structure of all consuming industries which then requires a re-examination of the other total outputs, and so on.

E. SOURCES AND DOCUMENTATION

The primary sources for this draft are the contributions by CIA/RR, G-2, ONI, and AFOIN. In addition, [REDACTED] 25X1X [REDACTED] 25X1X and particularly the work of CIA/RR, were used.

No documentation appears in this draft. However, thousands of pages of documentation are available in the files of the Working Group. If the Report receives approval and subsequently is formally published, the problem of appropriate documentation will have to be considered by the Working Group.

F. VALIDITY

No responsible economist can be complacent when contemplating the validity and reliability of Soviet Bloc economic intelligence estimates. However, the analytical technique presented here can be exploited to produce reliable and significant economic intelligence. Improvement in the product of this type of analysis must await quantitative production estimates, use patterns, and factor inputs which accurately reflect Soviet Bloc experience.

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Not all of the estimates are equally reliable. For instance, the coal and electric power production estimates are more reliable than those for petroleum products and aluminum or copper. Since no practicable method has been devised to identify the validity of each estimate, the draft reads as though all estimates are of equal validity. It is hoped that the vigorous criticisms of the intelligence community will assist in establishing the reliability of these estimates.

G. METHOD

The general philosophy underlying the Report is that the Soviet Bloc economy, indeed any economy, is a complex of interrelated activities in which events influencing one sector have repercussions on others, and these repercussions in turn affect other activities, and so on, until all lines of activity are influenced. This phenomenon is well known and is customarily described in terms of the general equilibrium characteristics of modern economics. The research technique devised to study general equilibrium processes quantitatively is called inter-industry economics (or structural or input-output analysis).

Alternative sets of demands have been imposed on the same economy. The first set of demands is known to be within the capability of the Soviet Bloc since it is now being met. The second set of demands, those of a hot war military situation, is then imposed on the economy to determine the capability--over-all and sector by sector--of fulfilling these demands.

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PART III

THE ANALYTICAL FRAMEWORK

The following brief statement of methodology is not intended as a complete exposition of the theory of economic capabilities and inter-industry economics. The Office of Research and Reports, Central Intelligence Agency, is at present drafting a methodology paper to be issued in the near future. What follows is a preview of that publication, emphasizing the concept of economic capabilities, the theory of inter-industry economics, and its application to the problem of estimating economic capabilities.

A nation does not possess "economic capabilities for war" in general; it either possesses, or does not possess, economic capabilities for a specific war, in a specific area, between specific dates. The concept of economic capabilities itself has meaning only insofar as it is related to a period of time, to a place, and to a particular activity. While it is true that in an economic system there can be no substitution, and that over a period of time the flexibility of the economy will enable it to meet alternative goals, it is also true that unless the economic capabilities estimate is particularistic, it will lose in precision of statement, may degenerate into a sort of economic capabilities index, and become non-quantifiable.

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The positive or negative over-all economic capabilities estimate is of limited usefulness, unless one is fully aware of all of the pitfalls in its construction. There are at least three stages in which the estimate may be invalidated. The first is the data stage; if the data are wrong, then the estimate may be wrong.

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Second, the analytical framework for the study of economic capabilities may not be applicable or may be logically inconsistent. Third, the specifications as to kind of war, place, and time period may not anticipate what will actually happen.

The entire economic intelligence community is working to improve its data; not only to get more data but to make existing and potential data more reliable. There is no easy solution; millions of research man-hours will be expended before intelligence officers can provide the policy-makers with sufficient, accurate, and precise data.

The quantitative requirements of specific courses of action by potential enemies is receiving more and more attention. What is needed are realistic assumptions about possible courses of action, couched in such terms that quantification in resource requirements is possible.

But all of the data and the most reasonable estimates of courses of action will be wasted if the research approach to the study of economic capabilities is inapplicable or conceptually unsound.

There have been, in general, two approaches to quantitative research in economic capabilities. One might be called summation; the other, integration.

The summation concept has been most commonly used. It amounts to a listing of the important aspects of strategic economic resources such as production, stockpiles, imports and exports, requirements,

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and geographic location for the economy of potential enemies, as well as the time path of these components over the recent past. The crudest example of this method is the listing of time series of production of strategic commodities, industrial products, and military end-items. From this listing and from what the intelligence officer mentally visualizes about their interrelationships and their relationships to the economic capabilities problem at hand, an estimate, largely subjective and non-quantitative, is made.

A more sophisticated form of summation has also been employed, in the form of the construction of index numbers for various parts of the economy and aggregation to produce an index for the entire economic system in which component parts are weighted according to their relative importance in the national economic effort. These time series are studied, their interrelationships examined and matched with possible demands of the various sectors of the economy, and again the intelligence officer, this time with a more reliable quantitative base, subjectively makes an estimate of economic capabilities.

The summation method has been subjected to severe criticism. One of the most serious criticisms which can be made is that its merit depends almost entirely on the competence of the intelligence officers who make the estimate. If they are of unusual ability, then the estimate will likely be good; if they are unimaginative and lack comprehension of the operation of an economy and the course of economic history, the estimate will likely be a poor one.

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The method of integration, by establishing causal relationships between the data and the conclusions, relies less on the intuitive judgment of the intelligence officer. The method places a premium on high-grade data. The intelligence officer continues to be an important ingredient of the estimate, but in a different way. The gap between the data and the final capabilities estimate is closed by virtue of more detailed and precise information which is organized, quantified, and statistically assimilated in such a way that the estimator is required to manipulate only those economic variables pertinent to the required intelligence estimate. The intelligence officer addresses himself more to getting more and better data, to the analytical framework and theoretical underpinnings of the estimate, and to the various assumptions under which the estimate is made.

Both methods are used; the summation method more frequently than the integration method. In most of the National Intelligence Estimates on economic capabilities the summation method is relied upon primarily, with the integration method more an intuitive process on the part of the estimators.

Intelligence Memorandum # 181, in which balances were struck for several important parts of the Soviet Bloc economy, was an early example of the use of the integration method. Similarly, the present study is an integration study; the first of its kind on this scale. However, the estimate itself which would utilize

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the analytical framework and data cannot be prepared, since the specifications of hot war requirements have not yet been made.

The integration method is frequently called inter-industry economics, input-output technique, or structural analysis. The basic conceptual framework dates back to Quesnay and his Tableau Economique (Eighteenth Century) and later, Walras' mathematical general equilibrium economic system (Nineteenth Century). However, the empirical implementation and the use of the technique in a wide range of practical problems comes largely from the work in the last two decades of Wassily Leontief.

It would be neither feasible nor desirable to attempt to telescope the entire method of inter-industry economics into just a few pages. For elementary expositions the reader is referred to:

Wassily Leontief, The Structure of the American Economy, 1919-1939, New York, 1951.

Duane Evans and Marvin Hoffenberg, "The Interindustry Relations Study for 1947," Review of Economics and Statistics, May, 1952.

The method employs the basic philosophy that any economic system is a complicated set of interrelationships wherein a given industry buys inputs from many other industries and sells its output to still others. The system of inter-industrial relationships can be depicted in mathematical equations; each equation representing an industry. When the system has been set up rigorously and all the quantities inserted, the variables become determinate.

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The system of equations can then be manipulated to indicate what happens to the output of all industries when the demand by one industry increases or decreases or when the amount of input per unit of output of an industry changes.

This is precisely the information that the intelligence officer needs to link his data directly to the capabilities estimate. He needs to know what outputs are required in order for the economy to support the demands of the military sector (the armed forces and armament industries) under specific wartime conditions for specified periods of time. The direct requirements of the campaigns are obtainable directly, by translating the military end item requirements into resource requirements. Given these resource requirements, the estimator must determine the capabilities of the economy to produce quantities adequate to meet the specified demand, since it is not sufficient merely to match the new demand with available quantities. Some of the demands of the non-military sectors are technologically fixed; others, for policy reasons, are inflexible; and others can be changed only slowly, by substitution. Hence, on the imposition of additional demands by the military sector, there will not only be the direct requirements, but also a complicated round of indirect requirements will be generated, raising the level of all outputs.

For example, suppose that the military authorities suddenly decided that they needed a million more tons of coal. Orders

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would be placed and gradually the higher level of production would be attained. But in order to get the additional production, it would be necessary to employ more coal miners, build more coal mining machinery to work the mines, use more electricity to keep the mines operating, use more petroleum products, transportation, and the output of many other industries. Hence, the output of each of these industries would expand. But in order to attain the expanded electric power output, more coal is needed; the additional workers in mining communities would use more coal, more electricity, and buy more services and goods; the new coal mining machinery would require metals, machines, and skilled workers. The increased demand for metals, machines, and labor would raise the output of still more industries requiring coal, and so on. The result of all these inter-related transactions might well be a need for 1.2 million tons of coal, instead of a million, and the output of many other industries would also have been increased in the process.

To take another case, from Table III in Part IV. The military demand for aluminum in the USSR under cold war conditions is 100,000 tons out of a total production of slightly more than 300,000 tons. The minimum military demand for aluminum in the USSR in war is about 300,000 tons. In order to get the additional aluminum, increased inputs of electric power, coal, transportation, construction, trade, and manpower are needed, requiring increased

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outputs in these industries. To expand output, these industries would require more aluminum, as well as larger inputs from other industries which would in turn require a larger aluminum input to expand their output. In order to compute the total required output of aluminum, it might be assumed that the household demand for aluminum would remain stationary; that stockpiling would cease, and that the existing stockpile would be drawn down 25 percent per year. Under these, and other conditions specified for the purpose of making the capabilities estimate, it is possible to compute exactly the level of output of all industries, including aluminum, necessary to sustain the new military demand.

The iterative process described above allows the estimator to vary the assumptions, industry by industry, about the demands of particular industries, about stockpiles and stockpiling, and about substitutions and cut-backs. While it is impossible to exhaust all of the inter-industrial relationships by iteration, it does permit varying the assumptions and results in a realistic estimate of economic capabilities.

A more precise method for determining both direct and indirect requirements is possible. First, a coefficient table is constructed from the transactions table; it is subtracted from an identity matrix and the result is inverted. The inverse is the solution to the system of equations implied in the transactions and coefficient table, under the single assumption that the input per unit output

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is fixed. In general, this more mechanistic solution is of limited usefulness, since the fixed coefficients assumption may not be realistic for a study of economic capabilities.

The integration method is by no means foolproof. Its most serious disadvantage is that it requires large amounts of accurate and precise data. For every industry a detailed breakdown of its costs (inputs) in terms of quantities of outputs of other industries is needed. Alternatively, a detailed listing of sales to all other industries is required. This information is not readily available even for the United States, where there are elaborate statistical gathering procedures. For the USSR and other Bloc countries it is even more difficult to obtain this type of information. However, with the use of proper sources the intelligence community is gradually building up a fund of knowledge of this type.

In addition, in the integration method there is the ever-present hazard that the mathematical rigor of the analyses will impart to the conclusions an unjustified sense of reliability.

The whole field of inter-industry economics and its relationship to quantitative economic research has been incompletely exploited, especially in intelligence research. As a method of integration it offers tremendous rewards, if used judiciously, not only in estimating economic capabilities, but also in other fields of intelligence research, such as target research, logistical planning, and strategic and operational military problems.

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PART IV

A. STRUCTURE OF THE ECONOMY OF THE USSR

Inter-industry studies for the Soviet Bloc as a whole, and for the European Satellites and China separately, have not reached the stage where there are sufficient systematic data to warrant their presentation in this manner. Therefore, the Master Tables as well as the sector analyses emphasize the USSR, with the European Satellites and China treated in the text and in textual tables.

A summary picture of the Soviet economy is given in the Consolidated USSR Transactions Table (Table I) and the percentage table (Table II) which accompanies it. In these tables the consuming industries have been aggregated to form the indicated industry groupings. Columns for imports, trade balance, domestic supply, and domestic consumption have been added. "Consuming industries" aggregate the items covered in the sector reports and frequently are not exhaustive of the classification, for example; metals is the sum of iron and steel, copper, and aluminum.

No attempt is made to summarize the significance of the economic structure presented in the Master Tables. Since it is an initial effort, promulgated primarily for purposes of criticism and for providing the data structure for an economic capabilities estimate, the Tables stand alone as the summary.

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However, in Part III (The Analytical Framework) is indicated a method whereby one can read significance into this type of summary.

The Transactions Table (Table 3) presents a partial, integrated description of the Soviet economy in terms of outputs from, and inputs into, specifically defined sectors or industries. Each row shows how the output of an industry is allocated to the various Consuming Industries of the economy and to Final Demand (the use pattern); each column indicates the inputs or resources which are utilized by the industry (input structure). Hence, each entry in the Table can be regarded as an output (that part allocated to the industry) or an input (that amount consumed by the industry).

Summation of all the elements in a row gives total production for each industry. Summation of the elements in a column is precluded since each element in a given column is in terms of a unique physical unit.

The percentage allocation table (Table IV) and the input coefficient table (Table V) are both derived from the Transactions Table (Table III). The percentage table simply forces the total output of each row to 100 percent and distributes this output percentage-wise. The coefficient table was derived by dividing the entries in a given column by the total output of the corresponding row. It gives in any column the input

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(for each input) per unit of output of the producing industry. For agriculture, textiles, and coke-chemicals, the corresponding row outputs selected were grain, cotton, and benzol respectively. These coefficients in Table V must be interpreted with care since they are in physical units and in varying orders of magnitude (some in thousands, other in millions).

The input coefficients give the unit production requirements for each industry and thus are a reflection of physical production costs for the industry. A complete listing of input coefficients would be the total real costs of production for a unit of output.

The Master Tables are only a partial representation of the Soviet economy. Some sectors have been entirely omitted, such as those industries engaged in the processing and fabrication of consumer goods and the personal service industries. Other activities are only partially covered; chemicals includes only synthetic rubber and coke-chemicals. This has resulted in a distorted and incommensurate table. The industry "Consuming Industries, n.e.c." is a measure of the lack of coverage in the tables.

The term Producing Industry is the name for an industry whose output is being distributed among the other industries of the economy. Consuming Industries and Final Demand are the consumers of this output. The distinction between the

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two is arbitrary; in the problem at hand, it was found convenient to classify "Households," "Defense," "Exports," and "Inventory Accretions" in Final Demand. The intermediate consumers or processors are called Consuming Industries and include industries 1 through 34.

Capital formation, which is usually treated as a Final Demand sector has been omitted as a separate sector. Inability to separate allocations (or inputs) into those for current and capital account means that each entry has a flow and capital component and is the total allocation (or input) regardless of whether it is for current operations or for expanding capacity.

Total output is defined as the total domestic production. Imports are specifically excluded, as well as inventory depletions. Total consumption is not necessarily the same as total output; consumption may be greater by either depleting inventories or by importing. Net exports are deducted from "Total Output" to arrive at "Domestic Supply." "Domestic Consumption" is determined by deducting inventory accretions from "Domestic Supply."

For the Producing Industries, the individual industries are defined in terms of their output, which is usually in metric tons of the finished product of the industry. For the basic textile materials, for the coke-chemicals, and for

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rubber, the allocation has not been to the immediate processing industry which actually receives the output but rather to the end-users of the product of the fabricating industries.

"Producing Industries, n.e.c." is destined as a measure of the inputs which are not elsewhere accounted for in the Table, as a percentage of the total value of the inputs. This row has not been filled in.

The Consuming Industries have a somewhat different classification. "Agriculture" is all of agriculture. The basic energy and metals industries include the entire vertical structure of operations of those industries, from the mining of the raw materials to the finished product. For the equipment items the classification includes the manufacture of those items only.

"Households" is a reflection of civilian consumption. "Defense" includes the military establishment and the armaments industries.

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USSR INPUT PATTERN FOR TOTAL OUTPUT

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	92.0	100.0
Meat 000,000 mt	4.3	100.0
Fats and oils 000 mt	2,000.0	100.0
Cotton 000 mt	960.0	100.0
Wool 000 mt	86.0	100.0
Hemp 000 mt	187.0	100.0
Electric power 000,000,000 KWH	124.0	100.0
Coal 000,000 mt	311.0	100.0
Petroleum 000,000 mt	41.8	100.0
Steel 000,000 mt	25.0	100.0
Copper 000 mt	300.0	100.0
Aluminum 000 mt	307.0	100.0
Rail transport 000,000,000 t/km	770.0	100.0
Motor transport 000,000,000 t/km	31.5	100.0
Water transport 000,000,000 t/km	129.7	100.0
Trucks 000 2-ton units	623.0	100.0
Tractors 000 15-hp units	387.0	100.0
Locomotives units	1,750.0	100.0
Rolling stock 000 2-axle units	152.0	100.0
Refined benzol 000 mt	257.0	100.0
Toluol 000 mt	76.3	100.0
Phenol 000 mt	51.7	100.0
Rubber 000 mt	276.0	100.0
Machine tools 000 units	97.0	100.0
Ball and roller bearings 000,000 units	108.0	100.0
Heavy motors and generators 000 KW	3,540.0	100.0
Coal mining machinery units	2,500.0	100.0
Electron tubes 000,000 US\$	52.0	100.0
Merchant shipbuilding 000 GRT	81.0	100.0
Construction %	100.0	100.0
Trade %	100.0	100.0
Producing industries, nec		
Households-labor 000 manyears	88,800.0	100.0
Inventory depletions		
Imports		

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USSR EXPORT PATTERN

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	4.0	4.3
Meat 000,000 mt	-	.
Fats and oils 000 mt	-	.
Cotton 000 mt	190	19.8
Wool 000 mt	8	9.3
Hemp 000 mt	4	2.1
Electric power 000,000,000 kwh	0	.
Coal 000,000 mt	0.3	.1
Petroleum 000,000 mt	0.3	.7
Steel 000,000 mt	-	.
Copper 000 mt	-	.
Aluminum 000 mt	-	.
Rail transport 000,000,000 ton km	0	.
Motor transport 000,000,000 ton km	0	.
Water transport 000,000,000 ton km	0	.
Trucks 000-2 ton units	0	.
Tractors 000-15 hp units	0	.
Locomotives units	0	.
Rolling stock 000-2 axle units	0	.
Refined benzol 000 mt	11.0	4.3
Toluol 000 mt	6.3	8.3
Phenol 000 mt	0.7	1.4
Rubber 000 mt	9	3.3
Machine tools 000 units	0	.
Ball and roller bearings 000,000 units	0.2	.2
Heavy motors and generators 000 kw	0	.
Coal mining machinery units	0	.
Electron tubes 000,000 US \$	0.1	.2
Merchant shipbuilding 000 GRT	0	.
Construction %	0	.
Trade %	0	.
Producing industries, nec		
Households-labor 000 manyears	0	.
Inventory depletions		
Imports		

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	-	
Textiles	0	
Electric Power	0	
Coal	9.5	
Petroleum	0	
Steel	0	
Copper	8.0	
Aluminum	3.0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	427	
Locomotives	26.4	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	96	
Machine Tools	-	
Ball & Roller Bearings	0	
Heavy Motors & Generators	1,386	
Coal Mining Machinery	-	
Electron Tubes	0	
Merchant Shipbuilding	200	
Construction	0	
Mining, n.e.c.	0	
Machinery, n.e.c.	0	
Trade	0	
Consuming Industries, n.e.c.		
Households		
Defense		
Army		
Navy		
Air		
Inventory Accretions		
Exports		
TOTAL OUTPUT		

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S-E-C-R-E-T

S-E-C-R-E-T

USSR PATTERN OF INVENTORY ACCOUNTS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	4.0	4.3
Meat 000,000 mt	-	
Fats and oils 000 mt	400	20
Cotton 000 mt	55	5.7
Wool 000 mt	14	16.2
Hemp 000 mt	-	
Electric power 000,000,000 kwh	0	
Coal 000,000 mt	3.0	1.0
Petroleum 000,000 mt	3.0	7.2
Steel 000,000 mt	-	
Copper 000 mt	30.0	10.0
Aluminum 000 mt	40	13.0
Rail transport 000,000,000 ton km	0	
Motor transport 000,000,000 ton km	0	
Water transport 000,000,000 ton km	0	
Trucks 000-2 ton units	0	
Tractors 000-15 hp units	0	
Locomotives units	0	
Rolling stock 000-2 axle units	0	
Refined benzol	16.5	6.4
Toluol 000 mt	7.0	9.2
Phenol 000 mt	5.1	9.9
Rubber 000 mt	22	8.0
Machine tools 000 units	1.9	2.0
Ball and roller bearings 000,000 units	0	
Heavy motors and generators	0	
Coal mining machinery units	0	
Electron tubes 000,000 US \$	0	
Merchant shipbuilding 000 GRT	0	
Construction %	0	
Trade %	0	
Producing industries, nec		
Households-labor 000 manyears	0	
Inventory depletions		
Imports		

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR CONSUMING INDUSTRIES, NEC

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	2.0	2.2
Meat 000,000 mt	-	
Fats and oils 000 mt	260	13
Cotton 000 mt	75	7.8
Wool 000 mt	8	9.3
Hemp 000 mt	53	28.3
Electric power 000,000,000 kwh	34.8	28.1
Coal 000,000 mt	58.7	18.9
Petroleum 000,000 mt	3.3	7.9
Steel 000,000 mt	1.4	5.6
Copper 000 mt	14.7	4.9
Aluminum 000 mt	23	7.5
Rail transport 000,000,000 ton km	160	20.8
Motor transport 000,000,000 ton km	1.9	6
Water transport 000,000,000 ton km	80.7	62.2
Trucks 000-2 ton units	258	41.4
Tractors 000-15 hp units	29	7.5
Locomotives units	0	
Rolling stock 000-2 axle units	0	
Refined benzol 000 mt	-	
Toluol 000 mt	-	
Phenol 000 mt	-	
Rubber 000 mt	30	10.9
Machino tools 000 units	23.3	24.0
Ball and roller bearings 000,000 units	2.0	1.8
Heavy motors and generators 000 kw	385	10.9
Coal mining machinery units	0	
Electron tubes 000,000 US \$	8.3	16.0
Merchant shipbuilding 000 GRT	0	
Construction %	6.4	6.4
Trade %	6.0	6.0
Producing industries, nec		
Households-labor manyears	4834	5.4
Inventory depletions	0	
Imports		

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S-E-C-R-E-T

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CONSOLIDATED USSR TRANSACTION TABLE

SECRET

PRODUCING INDUSTRIES	AGRICULTURE	TEXTILES	ENERGY	METALS	CHEMICALS	TRANSPORTATION	TRANSPORTATION EQUIPMENT	MACHINERY	CONSTRUCTION	TRADE	CONSUMING INDUSTRIES, n.e.c.	HOUSEHOLDS	DEFENSE	INVENTORY	EXPORTS	TOTAL OUTPUT	IMPORTS	TRADE BALANCE	DOMESTIC SUPPLY	DOMESTIC CONSUMPTION	IMPORT	EXPORT	
	NEGIGIBLE											BLANK NO ESTIMATE											
	* END-USE ALLOCATION																						
1 GRAIN (000,000 mt)	34.7	0.0	—	0.0	1.0	0.0	0.0	0.0	0.0	2.0	44.3	2.0	4.0	4.0	92.0	0.0	‡ 4.0	88.0	84.0				
2 MEAT (000,000 mt)	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	260	1210	30	400	—	2000	0.0	—	2000	1600				
3 FATS & OILS (000 mt)	100	—	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75	480	50	55	190	960	6	‡ 184	776	721				
4 COTTON (000 mt)	20	*	0.0	0.0	90	0.0	—	—	—	0.0	75	55	14	8	86	14	† 6	92	78				
5 WOOL (000 mt)	15	*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8	36	5	14	4	187	0.0	‡ 4	183	183				
6 HEMP (000 mt)	53	*	—	0.0	—	—	0.0	0.0	0.0	53	57	20	—	4	307	3	† 3	310	270				
7 ELECTRIC POWER (000,000,000 kwh)	5.0	—	31.5	16.4	—	4.1	1.3	0.4	—	0.5	42.5	18.0	3.0	0.0	0.0	124.0	0.0	0.0	124.0	124.0			
8 COAL (000,000 mt)	—	—	78.0	61.5	1.0	86.0	2.4	0.1	—	0.0	58.7	20.0	—	3.0	0.3	311	9.5	† 9.2	320.2	317.2			
9 PETROLEUM (000,000 mt)	8.8	—	2.5	—	17.2	—	—	—	0.0	6.8	2.9	3.3	—	0.3	41.8	0.0	‡ 0.3	41.5	41.5				
10 STEEL (000,000 mt)	0.0	0.0	0.7	4.4	0.0	2.5	3.9	5.3	4.2	0.0	1.4	—	2.6	—	—	25.0	0.0	—	25.0	25.0			
11 COPPER (000 mt)	0.0	0.0	90.0	3.6	0.0	0.0	13.0	34.7	25.0	0.0	14.7	29.0	60.0	30.0	—	300.0	8.0	† 8.0	308.0	278.0			
12 ALUMINUM (000 mt)	0.0	0.0	30	14	0.0	2	20	31	12	0.0	23	35	100	40	—	307	3	† 3	310	270			
13 RAIL TRANSPORT (000,000,000 ton km)	30	—	200	120	—	110	0.0	—	150	—	160	—	—	0.0	0.0	770	0.0	0.0	770	770			
14 MOTOR TRANSPORT (000,000,000 ton km)	3.6	0.6	1.8	1.2	—	2.0	0.0	2.2	—	6.4	1.9	9.6	2.2	0.0	0.0	31.5	0.0	0.0	31.5	31.5			
15 WATER TRANSPORT (000,000,000 ton km)	—	—	49.0	—	0.0	—	0.0	0.0	0.0	80.7	—	—	0.0	0.0	—	129.7	0.0	0.0	129.7	129.7			
16 TRUCKS (000-2-ton payload units)	60	0.0	0.0	0.0	—	305	0.0	—	—	—	258	—	—	0.0	0.0	623	0.0	0.0	623	623			
17 TRACTORS (000-15 hp wheeled units)	290	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29	—	29	—	39	0.0	0.0	387	0.0	0.0	387	387			
18 LOCOMOTIVES (units)	0.0	0.0	0.0	0.0	0.0	1700	50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1750	427	† 427	2177	2177			
19 ROLLING STOCK (000-2-axle units)	0.0	0.0	0.0	0.0	0.0	152	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	152	26	† 26	178	178			
20 REFINED BENZOL (000 mt)	4.4	4.0	77.6	0.0	141.5	0.0	0.0	0.0	0.0	—	—	2.0	16.5	11.0	257.0	—	‡ 11.0	246.0	229.5				
21 TOLUOL (000 mt)	—	—	15.1	0.0	28.4	0.0	0.0	0.0	0.0	—	—	19.5	7.0	6.3	76.3	—	‡ 6.3	70.0	63.0				
22 PHENOL (000 mt)	—	—	2.8	0.0	37.6	0.0	0.0	0.0	0.0	—	—	5.5	5.1	0.7	51.7	—	‡ 0.7	51.0	45.9				
23 RUBBER (000 mt)	20	0.0	0.0	0.0	*	100	—	6	—	30	44	45	22	9	276	96	† 86	382	340				
24 MACHINE TOOLS (000 units)	—	—	—	—	0.0	0.0	13.6	38.8	1.0	0.0	23.3	0.0	18.4	1.9	0.0	97.0	—	†	97.0	95.1			
25 BALL & ROLLER BEARINGS (000,000 units)	0.0	0.0	0.0	0.0	0.0	0.0	37.0	38.2	—	0.0	2.0	—	30.6	0.0	0.2	108.0	0.0	‡ 0.2	107.8	107.8			
26 HEAVY MOTORS & GENERATORS (000 kw)	—	—	1700	520	—	200	—	—	—	0.0	385	0.0	735	0.0	0.0	3540	1386	† 1386	4926	4926			
27 COAL MINING MACHINERY (units)	0.0	0.0	2500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2500	—	†	2500	2500			
28 ELECTRON TUBES (000,000 US \$)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	—	0.0	0.0	8.3	6.7	36.9	0.0	0.1	52.0	0.0	‡ 0.1	51.9	51.9			
29 MERCHANT SHIPBUILDING (000 GRT)	0.0	0.0	0.0	0.0	0.0	81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	81	200	† 200	281	281			
30 CONSTRUCTION (%)	11.1	2.4	14.8	10.6	0.0	13.5	0.0	10.0	—	0.0	16.3	21.3	0.0	0.0	0.0	100.0	0.0	0.0					
31 MINING, n.e.c.																							
32 MACHINERY, n.e.c.																							
33 TRADE (%)	4.0	12.0	3.5	7.5	—	5.0	0.0	9.0	0.0	1.0	6.0	32.0	20.0	0.0	0.0	100.0	0.0	0.0					
34 PRODUCING INDUSTRIES, n.e.c. (%) of total input																							
35 HOUSEHOLDS-LABOR (000 man-years)	51300	1200	1640	1070	275	4940	320	231	3200	3200	6574	10000	4350	0.0	0.0	88800							
36 INVENTORY DEPLETIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				

SECRET

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TABLE II
CONSOLIDATED USSR PERCENTAGE ALLOCATION TABLE

SECRET

PRODUCING INDUSTRIES	AGRICULTURE	TEXTILES	ENERGY	METALS	CHEMICALS	TRANSPORTATION	TRANSPORTATION EQUIPMENT	MACHINERY	CONSTRUCTION	TRADE	CONSUMING INDUSTRIES, n.e.c.	HOUSEHOLDS	DEFENSE	INVENTORY	EXPORTS	TOTAL OUTPUT	IMPORTS	TRADE BALANCE, [†] IMPORT - EXPORT	DOMESTIC SUPPLY	DOMESTIC CONSUMPTION		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21		
1 GRAIN (000,000 mt)	37.7					1.1							2.2	48.2	2.2	4.3	4.3	100.0	\$4.0	95.7	91.3	
2 MEAT (000,000 mt)													88.4	11.6			100.0	9.3	†9.3	109.3	109.3	
3 FATS & OILS (000 mt)	5.0												13.0	60.5	1.5	20.0		100.0		100.0	100.0	
4 COTTON (000 mt)	2.2					9.3							7.8	50.0	5.2	5.7	19.8	100.0	0.8	†19.2	80.8	75.1
5 WOOL (000 mt)	17.4												9.3	41.9	5.9	16.2	9.3	100.0	16.3	†7.0	107.0	90.7
6 HEMP (000 mt)	28.3												28.3	30.6	10.7		2.1	100.0		‡2.1	97.9	97.9
7 ELECTRIC POWER (000,000,000 kwh)	4.0		23.8	13.2		3.3	1.0	8.5		0.4	28.1	14.5	3.2				100.0		100.0	100.0		
8 COAL (000,000 mt)			25.1	19.8	0.3	27.6	0.8						18.9	6.4		1.0	0.1	100.0	3.1	†3.0	103.0	102.0
9 PETROLEUM (000,000 mt)	21.0			6.0			41.0						16.3	7.0	8.0	7.2	0.7	100.0		‡0.7	99.3	99.3
10 STEEL (000,000 mt)				2.8	17.6		10.4	15.2	21.2	16.8			5.6		10.4			100.0		100.0	100.0	
11 COPPER (000 mt)				30.0	1.2			4.3	11.6	8.3			4.9	9.7	20.0	10.0		100.0	2.7	†2.7	102.7	90.3
12 ALUMINUM (000 mt)					9.8	4.6		0.7	6.6	10.0	3.9		7.5	11.4	32.5	13.0		100.0	1.0	†1.0	101.0	87.9
13 RAIL TRANSPORT (000,000,000 ton km)	3.9			26.0	15.6		14.3				19.4		20.8					100.0		100.0	100.0	
14 MOTOR TRANSPORT (000,000,000 ton km)	11.4	1.9	5.8	3.9		6.4		7.0		20.2	6.0	30.4	7.0				100.0		100.0	100.0		
15 WATER TRANSPORT (000,000,000 ton km)					37.8								62.2					100.0		100.0	100.0	
16 TRUCKS (000-2-ton payload units)	9.6					49.0							41.4					100.0		100.0	100.0	
17 TRACTORS (000-15 hp wheeled units)	74.9										7.5		7.5		10.1			100.0		100.0	100.0	
18 LOCOMOTIVES (units)						97.1	2.9										100.0	24.4	†24.4	124.4	124.4	
19 ROLLING STOCK (000-2-axle units)						100.0											100.0	17.1	†17.1	117.1	117.1	
20 REFINED BENZOL (000 mt)	1.7	1.6	30.2		55.0									0.8	6.4	4.3	100.0		‡4.3	95.7	89.3	
21 TOLUOL (000 mt)				19.8		37.1								25.6	9.2	8.3	100.0		‡8.3	91.7	82.6	
22 PHENOL (000 mt)					5.4	72.7								10.6	9.9	1.4	100.0		‡1.4	98.6	88.3	
23 RUBBER (000 mt)	7.2					36.2		2.2			10.9	15.9	16.3	8.0	3.3	100.0	34.8	†31.2	131.2	123.2		
24 MACHINE TOOLS (000 units)								14.1	39.9	1.0			24.0		19.0	2.0		100.0		100.0	98.0	
25 BALL & ROLLER BEARINGS (000,000 units)								34.3	35.3				1.8		28.4		0.2	100.0		‡0.2	99.8	99.8
26 HEAVY MOTORS & GENERATORS (000 kw)			48.0	14.7		5.6							10.9		20.8			100.0	39.2	†39.2	139.2	139.2
27 COAL MINING MACHINERY (units)				100.0													100.0		100.0	100.0		
28 ELECTRON TUBES (000,000 US \$)													16.0	12.9	70.9		0.2	100.0		‡0.2	99.8	99.8
29 MERCHANT SHIPBUILDING (000 GRT)						100.0											100.0	246.9	†246.9	346.9	346.9	
30 CONSTRUCTION (x)	11.1	2.4	14.8	10.6		13.5		10.0			16.3	21.3					100.0					
31 MINING, n.e.c.																						
32 MACHINERY, n.e.c.																						
33 TRADE (x)	4.0	12.0	3.5	7.5		5.0		9.0		1.0	6.0	32.0	20.0				100.0					
34 PRODUCING INDUSTRIES, n.e.c. (% of total input)																						
35 HOUSEHOLDS-LABOR (000 man-years)	57.8	1.4	1.9	1.2	0.3	5.6	0.3	2.7	3.6	3.6	5.4	11.3	4.9				100.0					
39 INVENTORY DEPLETIONS																						

TABLE III
1952-1953 USSR TRANSACTIONS MATRIX

CONCLUDING INDUSTRIES

SECRET

TABLE III

1952-1953 USSR PERCENTAGE ALLOCATION MATRIX

SECRET

SECRET

CONSUMING INDUSTRIES

TABLE IV

1952-1953 USSR COEFFICIENT MATRIX

SECRET

CONSUMING INDUSTRIES

TRADE

SECURITY INFORMATION

MACHINERY, n.e.c.

MINING, n.e.c.

CONSTRUCTION

ELECTRON TUBES

MERCHANT SHIPBUILDING

COAL MINING MACHINERY

HEAVY MOTORS & GENERATORS

BALL & ROLLER BEARINGS

MACHINE TOOLS

RUBBER

COKE-CHEMICALS

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

MOTOR TRANSPORT

RAIL TRANSPORT

ALUMINUM

COPPER

STEEL

PETROLEUM

ELECTRIC POWER

COAL

TEXTILES

AGRICULTURE

GRAIN

FATS & OILS

COTTON

WOOL

Hemp

ELECTRIC POWER

COAL

PETROLEUM

STEEL

COPPER

ALUMINUM

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

MOTOR TRANSPORT

RAIL TRANSPORT

ALUMINUM

COPPER

STEEL

PETROLEUM

ELECTRIC POWER

COAL

TEXTILES

AGRICULTURE

GRAIN

FATS & OILS

COTTON

WOOL

Hemp

ELECTRIC POWER

COAL

PETROLEUM

STEEL

COPPER

ALUMINUM

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

MOTOR TRANSPORT

RAIL TRANSPORT

ALUMINUM

COPPER

STEEL

PETROLEUM

ELECTRIC POWER

COAL

TEXTILES

AGRICULTURE

GRAIN

FATS & OILS

COTTON

WOOL

Hemp

ELECTRIC POWER

COAL

PETROLEUM

STEEL

COPPER

ALUMINUM

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

MOTOR TRANSPORT

RAIL TRANSPORT

ALUMINUM

COPPER

STEEL

PETROLEUM

ELECTRIC POWER

COAL

TEXTILES

AGRICULTURE

GRAIN

FATS & OILS

COTTON

WOOL

Hemp

ELECTRIC POWER

COAL

PETROLEUM

STEEL

COPPER

ALUMINUM

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

MOTOR TRANSPORT

RAIL TRANSPORT

ALUMINUM

COPPER

STEEL

PETROLEUM

ELECTRIC POWER

COAL

TEXTILES

AGRICULTURE

GRAIN

FATS & OILS

COTTON

WOOL

Hemp

ELECTRIC POWER

COAL

PETROLEUM

STEEL

COPPER

ALUMINUM

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

MOTOR TRANSPORT

RAIL TRANSPORT

ALUMINUM

COPPER

STEEL

PETROLEUM

ELECTRIC POWER

COAL

TEXTILES

AGRICULTURE

GRAIN

FATS & OILS

COTTON

WOOL

Hemp

ELECTRIC POWER

COAL

PETROLEUM

STEEL

COPPER

ALUMINUM

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

MOTOR TRANSPORT

RAIL TRANSPORT

ALUMINUM

COPPER

STEEL

PETROLEUM

ELECTRIC POWER

COAL

TEXTILES

AGRICULTURE

GRAIN

FATS & OILS

COTTON

WOOL

Hemp

ELECTRIC POWER

COAL

PETROLEUM

STEEL

COPPER

ALUMINUM

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

MOTOR TRANSPORT

RAIL TRANSPORT

ALUMINUM

COPPER

STEEL

PETROLEUM

ELECTRIC POWER

COAL

TEXTILES

AGRICULTURE

GRAIN

FATS & OILS

COTTON

WOOL

Hemp

ELECTRIC POWER

COAL

PETROLEUM

STEEL

COPPER

ALUMINUM

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

MOTOR TRANSPORT

RAIL TRANSPORT

ALUMINUM

COPPER

STEEL

PETROLEUM

ELECTRIC POWER

COAL

TEXTILES

AGRICULTURE

GRAIN

FATS & OILS

COTTON

WOOL

Hemp

ELECTRIC POWER

COAL

PETROLEUM

STEEL

COPPER

ALUMINUM

ROLLING STOCK

LOCOMOTIVES

TRACTORS

TRUCKS

WATER TRANSPORT

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S-E-C-R-E-T

PART IV

B. AGRICULTURE

During the period 1 July 1952 to 1 July 1953, grains, meat, and fats and oils will provide about 80 percent of the caloric intake of the population of the Soviet Bloc, and of this intake, grains will account for more than two-thirds.

Trends

The agriculture sector has been one of the least successful Soviet Bloc enterprises. Despite strenuous efforts to increase the level of production, there has been a notable lack of success. The USSR has invested heavily in machinery and equipment in the agricultural sector and in farm improvement and irrigation type investments. However, production in general now stands at about the same level that prevailed in the late 1930's.

Total grain production has deteriorated over the last decade and 1952-1953 production will be below the 1939 level.

S-E-C-R-E-TGrain Production/
(million metric tons)

Year	Total Bloc			All Grains			
	Bread Grains	Rice	Other Grains	USSR	China	Satellites	Total
1939	106.0	49.2	101.0	99.8	107.0	49.6	256.4
1943	83.9	38.6	82.8	70.3	94.3	40.8	205.4
1946	82.3	47.1	77.2	66.4	111.7	28.4	206.5
1947	85.8	47.3	89.3	80.2	111.4	30.5	222.1
1948	92.2	49.0	88.6	74.9	116.9	38.1	229.9
1949	90.0	45.3	84.2	76.6	104.3	38.7	219.6
1950	92.1	46.4	83.9	77.9	107.8	36.9	222.6
1951	103.3	45.6	87.5	86.6	106.9	42.9	236.4

^{1/} Including wheat, rye, corn, oats, barley, rice, grain sorghum, and miscellaneous grains. Data have been adjusted to reflect barn production, not biological yield, which includes waste and losses of all kinds. Quantities are reported in metric tons.

Meat production in the USSR for 1951 was about 500,000 metric tons above the 1939 level. However, per capita, production in 1951 was not substantially changed from the 1939 level. For the Soviet Bloc as a whole, production was approximately one million tons less than the level achieved in 1939.

Meat Production in the Soviet Bloc
(millions of metric tons)

Year	Bloc	USSR	China	European Satellites
1939	10.4	2.7	4.7	2.9
1943	8.3	2.2	4.4	1.8
1946	8.0	2.2	4.4	1.4
1947	8.1	2.1	4.4	1.6
1948	8.2	2.3	4.4	1.5
1949	8.6	2.6	4.4	1.6
1950	9.0	2.9	4.4	1.7
1951	9.3	3.2	4.4	1.7

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Production of fats and oils has remained relatively stable in the Soviet Bloc since 1939.

Production of Fats and Oils in the Soviet Bloc 1/
(000,000 metric tons)

<u>Year</u>	<u>Vegetable Oils</u>	<u>Animal Fats</u>	<u>Total</u>	<u>USSR</u>	<u>China</u>	<u>European Satellites</u>
1939	4.6	2.8	7.4	1.4	4.5	1.5
1943	4.2	1.9	6.1	0.9	4.2	0.9
1946	4.5	1.7	6.2	0.9	4.7	0.7
1948	5.0	1.9	6.9	1.3	4.9	0.8
1951	5.4	2.3	7.7	1.8	5.0	1.0

1/ Includes soy beans, peanuts, rape seed, cotton seed, sesame, tung, linseed, castorseed, hempseed, teaseed, perilla, and tallowseed (vegetable oils), and animal fats and butter.

Supply

Grain. The total availability of grains in the Soviet Bloc for the period 1 July 1952 to 1 July 1953 will be 245 million metric tons, originating almost entirely from domestic production. Net imports by Czechoslovakia, Hungary, and Poland, will be negligible amounting to approximately 30,000 tons.

The USSR will produce 92 million tons, or 38 percent of total Soviet Bloc production; with the European Satellites producing 41 million tons (17 percent) and China, 112 million tons (46 percent). Satellite production is estimated to be as follows: Poland, 11.8; Rumania, 7.9; Hungary, 6.6; and East Germany, 5.7; million tons. The USSR is expected to produce 60 million tons of bread grains (wheat and rye) and 32 million tons of course grains.

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Meat. Total availability of meats in the Soviet Bloc (excluding China) in 1952-1953, will be about 7.1 million tons of carcass weight. Net imports are negligible, accounting for not more than 1,000 tons. Production in the USSR will be about 4.3 million metric tons and the European Satellites will produce 2.8 million metric tons.

Fats and Oils. The Soviet Bloc supply of fats and oils in 1952-1953, will be derived almost entirely from domestic production. Of a total availability of 7.2 million metric tons, only 19,000 will be imported. The USSR will produce about 2 million tons (28 percent of total Soviet Bloc supply), China will produce 4.2 million tons (58 percent), and the European Satellites about one million tons (14 percent).

Inventory

The Soviet Bloc maintains large (by Western standards) inventories of basic food items, probably amounting to as much as 6 percent to 10 percent of annual production. The inventory is continually turning over but its size provides a substantial buffer at any particular time. The following table indicates the magnitude of this inventory:

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Estimated Food Stock, 1 July 1953
 (000 metric tons)

<u>Country</u>	<u>Grains</u>	<u>Meat</u>	<u>Fats and Oils</u>
Albania	78		--
Bulgaria	644	3	--
Czechoslovakia	348	33	--
East Germany	2,853	151	--
Hungary	955		--
Poland	3,047	171	44
Rumania	1,263	1	--
European Satellites	9,188	359	44
USSR	14,000	--	--
China	0	--	368
Bloc	23,188	359	612

Pattern of Demand

Grain. The overall allocation of the supply of grain in the Soviet Bloc indicates that about a third is plowed back into agriculture and nearly a half goes to household consumption. The USSR exports slightly more than 4 percent of its grain output and sends about the same amount to inventory.

The use pattern in the European Satellites is similar to that of the USSR, while in China, a much larger percentage, of total, probably as much as 80 percent/ goes to direct household consumption.

Meat. In the USSR, about 88 percent of meat production will go to households with the remaining 12 percent going to the military establishment.

Fats and Oils. Fats and oils have a more complicated use pattern than do grains and meat production. However, even with the complicated product-mix of fats and oils, and heavy demands

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USSR USE PATTERN FOR GRAIN
(000,000.mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	34.7	37.7
Textiles	0	
Electric power	0	
Coal	0	
Petroleum	--	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	1.0	1.1
Machine tools	0	
Ball and roller bearings	0	
Heavy motors and generators	0	
Coal mining machinery	0	
Electron tubes	0	
Merchant shipbuilding	0	
Construction	0	
Mining, nec	0	
Machinery,nec	0	
Trade	0	
Consuming industries, nec	2.0	2.2
Households	44.3	48.2
Defense	2.0	2.2
Army		
Navy		
Air		
Inventory accretions	4.0	4.3
Exports	4.0	4.3
TOTAL OUTPUT	92.0	100.0

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USSR USE PATTERN FOR MEAT
(000,000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	—	
Textiles	0	
Electric power	0	
Coal	0	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	0	
Machine tools	0	
Ball and roller bearings	0	
Heavy motors and generators	0	
Coal mining machinery	0	
Electron tubes	0	
Merchant shipbuilding	0	
Construction	0	
Mining, nec	0	
Machinery, nec	0	
Trade	0	
Consuming industries, nec	—	
Households	3.8	88.4
Defense	0.5	11.6
Army		
Navy		
Air		
Inventory accretions	—	
Exports	—	
TOTAL OUTPUT	4.3	100.0

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USSR USE PATTERN FOR FATS AND OILS
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	100	5
Textiles	--	
Electric power	0	
Coal	0	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	0	
Machine tools	0	
Ball and roller bearings	0	
Heavy motors and generators	0	
Coal mining machinery	0	
Electron tubes	0	
Merchant shipbuilding	0	
Construction	0	
Mining, nec	0	
Machinery, nec	0	
Trade	0	
Consuming industries, nec	260	13
Households	1210	60.5
Defense	30	1.5
Army		
Navy		
Air		
Inventory accretions	400	20
Exports	--	
TOTAL OUTPUT	2000	100.0

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by industry for some products, households consume about 60 percent of fats and oils produced in the USSR and as much as 20 percent goes into inventory. About 5 percent goes back into agricultural production and the remainder is divided up among the various industrial sectors of the economy and the armaments industry.

The use patterns for agricultural products are relatively inflexible and are dominated largely by household consumption. Moreover, household consumption is suppressed below that level which would result from consumer preference. The present size and rate of growth of population in the Soviet Bloc in relation to the expansion of agricultural production precludes extensive shifting of the use patterns of agricultural commodities.

Input Structure

Considered as an industry, agriculture (not just grains, meat, and fats and oils) is the largest single consumer of many important inputs. It is by far the largest single employer of manpower, although this manpower is primarily unskilled. The movement of agricultural commodities uses more motor transportation than does any other single industry, and in addition, consumes a substantial amount of rail transportation. The agriculture sector is also a large consumer of energy, construction, and some types of transport equipment such as trucks and tractors.

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USSR INPUT PATTERN FOR AGRICULTURE

Producing Industry	Quantity	Percentage
Grain (000,000 mt)	34.7	37.7
Meat (000,000 mt)	--	
Fats and oils (000 mt)	100	5
Cotton (000 mt)	20	2.2
Wool (000 mt)	15	17.4
Hemp (000 mt)	53	28.3
Electric power (000,000,000 KWH)	5.0	4.0
Coal (000,000 mt)	--	
Petroleum (000,000 mt)	7.6	18.2
Steel (000,000 mt)	0	
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)	30	3.9
Motor transport (000,000,000 ton km)	3.6	11.4
Water transport (000,000,000 ton km)		
Trucks (000 - 2 ton units)	60	9.6
Tractors (000 - 15 hp units)	290	74.9
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	4.4	1.7
Toluol (000 mt)	--	
Phenol (000 mt)	--	
Rubber (000 mt)	20	7.2
Machine tools (000 units)	--	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 kw)	--	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	11.1	11.1
Trade (%)	4.0	4.0
Producing industries, nec		
Households-labor (000 man years)	51300	57.8
Inventory depletions	0	
Imports	--	

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The investment program in agriculture is substantial, making it an important indirect user of large quantities of metals and construction materials.

USSR Agricultural Equipment Inputs, 1952-1953
(000 units)

Tractor Plows (moldboard types)	150
Combines	60
Tractor Seed-drills	150
Tractor Cultivators	125
Agricultural Machinery, all types	2,500

Summary

Agriculture has been one of the least successful enterprises in the Soviet Bloc, notably in the USSR. Its failure to grow at rates comparable to the growth of the industrial sectors has resulted in lowered standards of living for the population. While the direct influence upon industrial sectors is not great, the failure to produce adequate supplies of agricultural commodities has tended to lower labor productivity and thus has indirectly impaired industrial production.

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PART IV

C. TEXTILES

Despite strenuous efforts to increase production, the output of basic textile materials in the Soviet Bloc in 1951 was virtually unchanged from levels of output achieved at the beginning of World War II.

Trends

Cotton production in the Soviet Bloc has not increased significantly in the past fifteen years. In recent years, production has steadily recovered from wartime low levels and at present is only slightly less than the peak pre-war output of 1939. At the same time, per capita cotton production has deteriorated; and in 1951 amounted to about 9 pounds as compared with 11 pounds in 1939.

Production of Cotton Lint
(thousands of metric tons)

<u>Year</u>	<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>European Satellites</u>
1937	1,591	806	774	12
1939	1,288	871	410	8
1948	1,043	566	469	8
1949	963	588	370	6
1950	1,252	718	529	5
1951	1,509	827	675	7

Wool production (clean basis) in the Soviet Bloc in 1951 was about 10 percent greater than in 1939, with the increase accounted for entirely by the USSR which increased its production by about 27 percent between 1939 and 1951.

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USSR per capita wool production in 1951 was about 13 percent higher than per capita production in 1939.

<u>Year</u>	<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>European Satellites</u>
1939	222	132	39	52
1948	191	119	34	38
1949	218	145	34	40
1950	228	152	34	42
1951	244	168	34	42

* Grease weight. The figures in this table are not directly comparable with 1952-53 estimates since the latter are on a scoured basis.

Production of hemp in the USSR was 58 percent greater in 1951 than in 1939. This expansion accounted for a 20 percent increase in Bloc output inasmuch as production in China and the European Satellites had not recovered to 1939 levels.

<u>Year</u>	<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>European Satellites</u>
1939	206.2	110.0	14.6	81.6
1948	210.1	141.7	11.0	57.4
1949	246.4	174.0	11.0	61.4
1950	246.9	174.0	11.0	61.9
1951	246.9	174.0	11.0	61.9

With respect to textile mill products, Soviet Bloc output in 1951 was somewhat higher than in 1939. Furthermore, the Fifth Five Year Plan includes ambitious plans for textile products; cotton fabrics are due to increase by 55 percent to 65 percent

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over 1950 and wool fabrics 2 to 2.5 times the 1950 level. The goals can be achieved if the USSR decides to divert sufficient resources for this purpose. However, past experience indicates that Five-Year Plan goals in textile products are flexible downward.

	<u>Textile Mill Output</u> (000 metric tons)					
	<u>1938</u>	<u>1940</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>
<u>Cotton Yarn</u>						
Bloc	1,103	1,088	1,029	1,050	1,148	1,206
USSR	559	595	493	562	607	630
China	300	300	336	260	300	325
E. Sat.	244	193	200	228	241	251
<u>Wool Yarn</u>						
Bloc	205	185	157	182	186	189
USSR	78	78	71	85	88	88
China	3	3	3	3	3	3
E. Sat.	124	104	83	94	95	98
<u>Rayon</u>						
Bloc	101	138	103	137	150	197
USSR	11	15	19	25	34	41
E. Germany	76	106	41	64	69	98
Other Sat.	14	17	43	48	47	58
<u>Silk Production</u>						
Bloc	5.7	5.3	6.4	6.0	6.1	6.1
USSR	1.7	1.7	1.5	1.5	1.5	1.5
China	3.9	3.5	4.8	4.4	4.5	4.5
E. Sat.	0.1	0.1	0.1	0.1	0.1	0.1

Supply

Cotton. Total availability of cotton in the period 1 July 1952 to 1 July 1953 will be 1,770,000 tons, of which net imports will account for 104,000 tons. The USSR with 960,000 tons or

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57 percent of total Bloc production, is the biggest producer, followed by China, 681,000 tons (41 percent) and the European Satellites, 26,000 tons (2 percent).

China accounts for 50 percent of total Soviet Bloc imports of raw cotton with Czechoslovakia and Poland accounting for four-fifths of the remainder.

Wool. The total availability of wool for 1952-1953 will be about 151,000 tons, of which 86,000 will be produced in the USSR. The European Satellites will produce about 25,000 tons and China about 21,000 tons. Net imported wool will be 19,000 tons for the Bloc. The Satellites have a positive net trade balance of 21,000 tons; China has a 7,000 export balance; and the USSR, 5,000 import balance.

Hemp. The total supply of hemp in the Soviet Bloc will be 284,000 metric tons. USSR production of 183,000 metric tons, represents 65 percent of Bloc output, while China accounts for 14 percent and the European Satellites, 21 percent of total production. Rumania, Hungary, Poland, and Czechoslovakia are the largest Satellite producers. There are no net imports of hemp into the Soviet Bloc.

Inventory

The mid-year 1952 strategic inventory of cotton(ginned basis) in the Soviet Bloc was about 232,000 metric tons or about 14 percent of estimated production. The wool (clean basis)

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inventory was about 64,000 metric tons, or about 48 percent of annual production. These stocks are held primarily in the USSR, with the European Satellites and China holding only working inventories amounting to approximately one or two months supply. It is possible that some stocks of hard fibers are held by the USSR.

Pattern of Demand

Cotton. Virtually all of the available cotton goes to the textile manufacturing industry and from that industry to the ultimate consumer. Households, the largest single consumer of cotton, in the form of textile mill products, clothing, and other finished textile products account for about 50 percent of cotton consumption. Nearly 20 percent, about 190,000 tons, of the cotton produced in the USSR is exported to European Satellites. Slightly less than 10 percent of cotton production goes into the manufacture of various kinds of rubber products. The military sector takes about 5 percent.

In the Soviet Bloc as a whole a somewhat larger proportion is used for household consumption purposes with the European Satellites diverting approximately 75 percent to households and China about 70 percent.

Wool. The use of wool in the Soviet Bloc is also oriented primarily toward the household sector. In the USSR household consumption takes about 42 percent of total wool production.

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USSR USE PATTERN FOR COTTON
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	20	
Textiles	*	2.2
Electric power	0	
Coal	0	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	1	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	90	9.3
Machine Tools	0	
Ball and roller bearings	0	
Heavy motors and generators	11	
Coal mining machinery	0	
Electron tubes	0	
Merchant shipbuilding	1	
Construction	1	
Mining, nec	0	
Machinery, nec	1	
Trade	0	
Consuming industries, nec	75	7.8
Households	480	50.0
Defense	50	5.2
Army		
Navy		
Air		
Inventory accritions	55	5.7
Exports	190	19.8
TOTAL OUTPUT	960	100.0

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USSR USE PATTERN FOR WOOL
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	15	17.4
Textiles	*	
Electric power	0	
Coal	0	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	0	
Machine tools	0	
Ball and roller bearings	0	
Heavy motors and generators	0	
Coal mining machinery	0	
Electron tubes	0	
Merchant shipbuilding	0	
Construction	0	
Mining, nec	0	
Machinery, nec	0	
Trade	0	
Consuming industries, nec	8	9.3
Households	36	41.9
Defense	5	5.9
Army		
Navy		
Air		
Inventory accretions	14	16.2
Exports	8	9.3
TOTAL OUTPUT	86	100.0

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Agriculture receives about 17 percent, the military about 6 percent, and slightly more than 15 percent goes to inventory. Slightly more than 9 percent of total wool production is exported from the USSR. The use patterns in the European Satellites are dissimilar; households will consume about 70 percent. The European Satellites produce about 25,000 tons and import about 21,000 tons from both the USSR and the West. In China, nearly a third of wool will be exported and households will use about one half of production.

Hemp. About 10 percent of the hemp produced in the USSR is used in the military sector of the economy; households consume about 30 percent and manufacturing industries use about 30 percent. Somewhat less than 30 percent goes back into the agricultural sector.

About 25 percent of flax in the USSR is used by industry and slightly more than half goes back into agriculture. Households use 12 percent and the military sector, 10 percent. In the European Satellites proportionately more goes into industry, (about 40 percent), agriculture, proportionately less, (28 percent), and households more (24 percent).

Silk is used by households and the military sector in the Soviet Bloc in a 2 to 1 ratio. Jute and hard fibers in the Bloc are used by agriculture and industry in about a 2 to 1 ratio.

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USSR USE PATTERN FOR HEMP
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	53	28.3
Textiles	*	
Electric power	0	
Coal	--	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	--	
Motor Transport	--	
Water Transport	--	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	--	
Machine tools	0	
Ball and roller bearings	0	
Heavy motors and generators	0	
Coal mining machinery	0	
Electron tubes	0	
Merchant shipbuilding	0	
Construction	0	
Mining, nec	--	
Machinery, nec	0	
Trade	0	
Consuming industries, nec	53	28.3
Households	57	30.6
Defense	20	10.7
Army		
Navy		
Air		
Inventory accretions	--	
Exports	4	2.1
TOTAL OUTPUT	187	100.0

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Input Structure

The inputs allocated to the textile industry are the total inputs into the culture, processing, and manufacturing of textiles and textile mill products. Since the industry is a multi-stage operation and the output of one stage becomes an input at another stage, these internal flows are eliminated in the total picture.

The most important single input is manpower; employment is about 1,200,000 full-time employee equivalents per year. Other important inputs are transportation, trade, and some chemical products. Textile machinery as well as some agricultural machinery are also important inputs into the industry.

The primary obstacle to expansion in the industry has not been the availability of inputs in general, but climactic obstacles to the growing cotton and wool. Such inputs, warm climate, abundant moisture^{and}, natural irrigation on a large scale, are not subject to administrative allocation and are in relatively short supply in the Soviet Bloc.

Summary

The textile industry in the Soviet Bloc is a slowly expanding activity, hampered by untoward natural conditions. Sufficient textile products are available to clothe the population and provide necessary supplies for the industrial sectors.

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USSR INPUT PATTERN FOR TEXTILES

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	--	
Cotton (000 mt)	*	
Wool (000 mt)	*	
Hemp (000 mt)	*	
Electric power (000,000,000 KWH)	--	
Coal (000,000 mt)	--	
Petroleum (000,000 mt)	--	
Steel (000,000 mt)	0	
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)	--	
Motor transport (000,000,000 ton km)	0.6	1.9
Water transport (000,000,000 ton km)	--	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	4.0	1.6
Toluol (000 mt)	--	
Phenol (000 mt)	--	
Rubber (000 mt)	0	
Machine tools (000 units)	--	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 kw)	--	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	2.4	2.4
Trade (%)	12.0	12.0
Producing industries, nec		
Households-labor (000 man years)	1200	1.4
Inventory depletions	0	
Imports	0	

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PART IV

D. ENERGY

The basic sources of energy are coal, petroleum, and the forces of gravity and wind. The Soviet Bloc is well supplied with the basic energy sources. The USSR in particular has a vast reservoir of unexploited resources. With 17 percent of the area of the world, and 15 percent of the energy resources, the USSR accounts for only 9 percent of world energy production. The United States, on the other hand, with 6 percent of the world area and about 29 percent of world energy resources, accounts for 38 percent of world energy production. Europe has 4 percent of world area, uses more than 38 percent of world energy, but has only slightly more than 9 percent of world energy resources.

The vast energy potential of the USSR is widely distributed; there are large reserves of coal of all kinds, untapped reserves of petroleum are being exploited rapidly, and the USSR uses only a small fraction of the available water power capacity.

The European Satellites are less well off. Each is producing energy at a rate higher than their percentage of world resources. China, on the other hand, has great reserves, probably about a fourth of total world resources, but is producing only a small fraction of world energy.

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USSR INPUT PATTERN FOR ENERGY

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	-	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	-	
Electric power (000,000,000 kwh)	31.5	23.8
Coal (000,000 mt)	78.0	25.1
Petroleum (000,000 mt)	2.2	5.3
Steel (000,000 mt)	0.7	2.8
Copper (000 mt)	90.0	30.0
Aluminum (000 mt)	30.0	9.8
Rail transport (000,000 ton km)	200	26.0
Motor transport (000,000,000 ton km)	1.8	5.8
Water transport (000,000,000 ton km)	49.0	
Trucks (000-2 ton units)	0	
Tractors (000-15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000-2 axle units)	0	
Refined benzol (000 mt)	77.6	30.2
Toluol (000 mt)	15.1	19.8
Phenol (000 mt)	2.8	5.4
Rubber (000 mt)	0	
Machine tools (000 units)	-	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 kw)	1700	48.0
Coal mining machinery (units)	2500	100.0
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	14.8	14.8
Trade (%)	3.5	3.5
Producing industries, nec		
Households-labor (000 manyears)	1640	1.9
Inventory depletions	0	
Imports		

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COAL

The production of coal in the Soviet Bloc provides the economy with its basic energy resource. Coal is relatively more important than it is in the West because the general level of industrialization in the Bloc is somewhat less advanced. In the West, the coal industry is a declining industry. In the Soviet Bloc the industry is still growing, even though the rate of growth in the postwar period is slackening slightly. The Soviet Bloc produces nearly all grades and varieties of coal, including anthracite, bituminous, sub-bituminous, lignite, brown coal, and peat.

Trends

The postwar trend of USSR production is nearly a straight line with a steeper slope than that of the prewar rate of growth. There was a significant decline during the war which carried the USSR back to the level of about 1932. Since the war advancement has been rapid and all planned goals have been achieved or over-fulfilled. The goal of the Fifth Five Year Plan of 375 million metric tons is easily within the capabilities of the USSR.

Of the European Satellites, Poland is the most important hard coal producer, with East Germany an significant lignite producer.

S-E-C-R-E-TSoviet Bloc Coal Production
(000,000 mt)

	<u>1938</u>	<u>1940</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>
Anthracite & Bituminous Coal						
Bloc	232	284	254	284	318	344
USSR	115	139	146	166	187	203
China	32	47	20	27	35	41
Poland	69	77	70	74	78	82
Czechoslovakia	16	21	18	17	18	18
Lignite						
Bloc	171	239	218	243	265	266
USSR	18	27	63	70	75	79
East Germany	120	169	111	124	138	159
Other Satellites	33	43	44	49	52	28

Supply

The accompanying table indicates the supply position of the Soviet Bloc in solid fuels for 1952-1953:

Soviet Bloc Supply of Solid Fuels 1952-1953
(000,000 metric tons)

	<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>Eur. Sats.</u>
Supply				
Anthracite & Bituminous	372.0	232.7	44.0	95.3
Brown and Lignite	319.0	87.5	0	231.5
Total	691.0	320.2	44.0	326.8
Production				
Anthracite & Bituminous	381.5	224.0	45.5	112.0
Brown and Lignite	319.5	87.0	0.5	232.0
Total	701.0	311.0	46.0	344.0
Imports				
Anthracite & Bituminous	17.2	9.0	0	8.2
Brown and Lignite	4.5	0.5	0	4.0
Total	21.7	9.5	0	12.2

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<u>Exports</u>	<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>Eur. Sats.</u>
Anthracite & Bituminous	26.7	0.3	1.5	24.9
Brown and Lignite	5.0	0	0.5	4.5
Total	31.7	0.3	2.0	29.4

Anthracite and bituminous production constitute about 72 percent of total coal production in the USSR. The European Satellites, on the other hand, produce primarily lignite and brown coal, with anthracite and bituminous making up only 33 percent of their total production. China produces only small quantities of coal, nearly all of which is bituminous and anthracite.

The supply of coal available for use in the Soviet Bloc is somewhat different than domestic production, due both to the import-export balance and to increases in working stocks. Poland exports about 28 percent of its hard coal production, with about one-third going to the West and two-thirds going to other members of the Bloc, especially the USSR.

Inventory

The Soviet Bloc does not stockpile coal but maintains very large working inventories.

Coal Inventory
(000,000,000 mt)

	<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>Eur. Sats.</u>
Anthracite and Bituminous	3.0	3.0	0	0
Brown and Lignite	0.1	0	0.1	0
Total	3.1	3.0	0.1	0

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Pattern of Demand

The major consumers of coal in the USSR are the electric power industry (22.9 percent), railroads (27.2 percent), and the steel industry (19.3 percent). The steel industry's consumption is largely for coking purposes.

There is a differentiation in use between hard coal and lignite and brown coal. Lignite and brown coal are consumed primarily in the electric power industry. These soft coals are also used to a limited extent in coke production in the European Satellites, but not in the USSR. Hard and soft coal can be substituted in almost any use, but with varying degrees of efficiency. The most efficient use of brown coal and lignite, which has a lower Btu content, is in the generation of electric power and in heating industrial and private establishments. The following tables show the use patterns of coal types in the Soviet Bloc.

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USSR USE PATTERN FOR COAL
(000,000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	-	
Textiles	-	
Electric power	71.0	22.9
Coal	5.0	1.6
Petroleum	2.0	.6
Steel	60.0	19.3
Copper	0.5	.2
Aluminum	1.0	.3
Rail Transport	85.0	27.3
Motor Transport	0	
Water Transport	1.0	.3
Trucks	1.3	.4
Tractors	0.8	.3
Locomotives	0.1	
Rolling Stock	0.2	.1
Coke-chemicals	-	
Rubber	1.0	.3
Machine Tools	0	
Ball & Roller Bearings	0	
Heavy Motors & Generators	.1	
Coal Mining Machinery	0	
Electron Tubes	0	
Merchant Shipbuilding	0	
Construction	-	
Mining, n.e.c.	-	
Machinery, n.e.c.	-	
Trade	0	
Consuming Industries, n.e.c.	58.7	18.9
Households	20.0	6.4
Defense		
Army		
Navy		
Air		
Inventory Accretions	3.0	1.0
Exports	0.3	.1
TOTAL OUTPUT	311.0	100.0

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Estimated Consumption Pattern of Hard Coal in the Soviet Bloc,
1 July 1952 to 1 July 1953

(percent of total consumption)

<u>Consuming Industry</u>	<u>USSR</u>	<u>China</u>	<u>Satellites</u>	<u>Bloc</u>
Mines	--	6.3	4.2	1.8
Briquette Plants	2.1	n.a.	1.4	1.7
Electric Power	12.5	13.1	15.8	13.6
Gas Works	0.3	1.1	3.5	1.2
Railroads	32.6	18.2	14.2	26.1
Water Transport	0.5	1.3	0.0	0.6
Coke	23.9	4.3	22.0	21.0
Iron and Steel	3.9	0.9)	1.8)	3.0)
Nonferrous	n.a.)))
Chemicals	n.a.	n.a.	0.0	0.0
Synthetic Liquid Fuel	1.7	n.a.	0.0	1.1
Cement Brick	n.a.	3.9	1.6	0.9
Heating (private)	6.5	28.1	16.2	11.6
Other	15.8	23.0	18.9	17.3
Total	99.8	100.2	99.6	99.9
Total hard coal consumption (metric tons)	(229,500)	(44,000)	(95,263)	(368,963)

Estimated Consumption Pattern of Lignite and Brown Coal in
the Soviet Bloc, 1 July 1952 to 1 July 1953

(percent of total consumption)

<u>Consuming Industry</u>	<u>USSR</u>	<u>Satellites</u>	<u>Bloc</u>
Mines		0.1	0.1
Electric Power	47.5	30.0	34.9
Gas Works		0.3	0.3
Railroads	11.7	11.1	11.3
Water Transport		0.1	0.1
Coke		14.4	10.3
Iron and Steel		0.9	0.6
Nonferrous	n.a.		
Chemicals	n.a.	0.8	0.5
Synthetic Liquid Fuel		6.9	5.0
Cement, Bricks	n.a.	0.7	0.5
Heating	5.7	8.9	8.0
Unallocated	35.1	25.8	28.3
Total	100.0	100.0	99.9
Total lignite and brown coal (metric tons)	(87,500)	(225,613)	(313,113)

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Comparison of the USSR and Satellite consumptions reveals that relatively more hard coal is used in the Satellite electric power industry, with relatively less consumed by the Satellite railroads and coke industry (iron and steel industry). Heating consumes 16.2 percent of coal supplies in the Satellites, in contrast to 6.5 percent in the USSR. On the other hand, about half of the lignite and brown coal in the USSR is consumed by the electric power industry in contrast to only 30 percent in the Satellites. Coke production currently utilizes about 15 percent of lignite and brown coal supply in the European Satellites.

Inputs

Inputs into the coal industry in the USSR as shown in the following tabulation.

USSR Coal Machinery Input
(units)

Coal loaders	900
Coal combines	400
Coal cutters	1,250

Summary

The overall position of the Soviet Bloc in regard to coal supplies is satisfactory. Some increase in the demand for coal could be met without increasing production by restricting the consumption of coal for heating and other uses.

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USSR INPUT PATTERN FOR COAL

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	4.5	3.6
Coal (000,000 mt)	5.0	1.6
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	0	
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)	160	20.8
Motor transport (000,000,000 ton km)	0.6	1.9
Water transport (000,000,000 ton km)	-	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	0	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	2500	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	5.5	
Trade (%)	1.0	1.0
Producing industries, nec		
Households-labor (000 man years)	1000	1.1
Inventory depletions	0	
Imports	9.5	

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Coal production of all types can be increased if the Soviet Bloc is willing to direct men and machinery into the coal industry. The major limiting factor that would tend to prevent the growth, or the shifting of coal supplies, is the availability of transportation facilities.

PETROLEUM

The petroleum industry of the Soviet Bloc is one of the oldest industries. Petroleum which was an important export during Czarist rule, ceased to be exported at the beginning of Bolshevik rule. With the advent of industrialization, petroleum has become one of the most critical measures of the war-making capability of the Soviet Bloc. The USSR is the dominant petroleum producer within the Bloc with Rumania a poor second. It is estimated that the USSR has 10 to 20 percent of world petroleum resources.

Trends

The following table shows the trend of production in the Soviet Bloc.

Crude Petroleum Production
(000,000 mt)

<u>Year</u>	<u>Bloc</u>	<u>USSR</u>	<u>Rumania</u>
1938	36.8	30.2	6.6
1940	37.0	31.2	5.8
1948	33.4	29.2	4.2
1949	37.9	33.4	4.5
1950	42.1	37.5	4.6
1951	47.0	41.0	6.0

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For the USSR, Stalin, in his February, 1946, speech set a goal of 60 million metric tons for 1960. While this seemed ambitious at that time, the Fifth Five Year Plan specifies a goal of about 70 million metric tons for 1955. This change in plan is indicative of the increased activity of the petroleum industry in the USSR and especially in the Second Baku, and also indicates the increased capacity of the USSR to expand the petroleum industry. The 70 million metric ton goal for 1955, while ambitious, is entirely within the realm of possibility and will probably be achieved.

Much of the difficulty in interpreting plan goals is a semantic problem. Petroleum is a term which usually includes natural gas. At this time it does not appear likely that the USSR will be able to produce 70 million metric tons of oil by 1955.

Much of the gains in recent years have come from the Second Baku, a relatively new and rapidly growing field. Since the USSR is a carefully planned economy, their exploitation of resources should be aimed at achieving maximum production and would be arranged in such a manner that petroleum would not be extracted from the ground in an uneconomical fashion. However, in the desire for increased production in the short run, Soviet fields are being drilled intensively, wasting much of the natural pressure and making unavoidable a high residual loss, unextractable from the ground.

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S-E-C-R-E-TSupply

The Soviet Bloc supply of petroleum, in terms of petroleum products, for 1952-1953, will be slightly more than 50 million metric tons, of which not quite 42 million metric tons comes from the USSR. Foreign trade is not an important element in the petroleum supply situation, except for Austria. The Soviet Zone of Occupation in Austria is included in the following table in the Soviet Bloc imports. The crude production in East Austria is entirely under Soviet control and is logically a part of the crude supply of the Soviet Bloc. East German production is primarily petroleum products manufactured synthetically.

Soviet Bloc Petroleum Supply 1952 - 1953
(000,000 mt)

	<u>Soviet Bloc</u>	<u>USSR</u>	<u>China</u>	<u>E. Sats.</u>	<u>E. Ger.</u>	<u>Rumania</u>
Supply	50.8	41.5	0.4	8.9		
Production	49.3	41.8	0.4	7.1	1.3	4.4
Imports	+2.0	0	0	+2.0		
Exports	-0.5	-0.3	0	-0.2		

Inventory

The Soviet Bloc is estimated to have between 15 and 20 million metric tons of petroleum products in inventories and stockpiles or about a two to four month's supply of petroleum products, under peace time conditions. The great bulk of this stockpiling is in the USSR.

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S-E-C-R-E-TUSSR USE PATTERN FOR PETROLEUM
(000,000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	8.8	21.0
Textiles	-	
Electric power	2.5	6.0
Coal	-	
Petroleum		
Steel		
Copper	-	
Aluminum	-	
Rail Transport	3.8	9.0
Motor Transport	11.7	28.0
Water Transport	1.7	4.0
Trucks	-	
Tractors	-	
Locomotives	-	
Rolling Stock	-	
Coke-chemicals	-	
Rubber	-	
Machine tools	-	
Ball and roller bearings	-	
Heavy motors and generators	-	
Coal mining machinery	-	
Electron tubes	0	
Merchant shipbuilding	-	
Construction	-	
Mining, n.e.c.	-	
Machinery, n.e.c.		
Trade	0	
Consuming industries, n.e.c.	7.1	17.0
Households	2.9	7.0
Defense	3.3	8.0
Army		
Navy		
Air		
Inventory accretions		
Exports		
TOTAL OUTPUT	41.8	100.0

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Pattern of Demand

The most important users of petroleum products in the order of quantities consumed are the motor transport industry, the agricultural sector, the military establishment, and the iron and steel industry. These consumers take nearly 60 percent of petroleum products.

One of the most notable characteristics of the pattern of use, not only in the USSR but also in the European Satellites, is the relatively small proportion of the output of the industry going to the household sector for purposes of transportation and recreation. This fact is often cited as an advantage of the Bloc over the West since the Bloc can use these products for military and other uses, whereas in the West, because of the inflexibility of the petroleum use pattern, large supplies must go to the household sector. Labor productivity, however, suffers somewhat as a result of the lack of civilian vehicles.

The use pattern for petroleum products is misleading in that it is not always the bulk of total products which is important in economic capabilities. Both aviation gasoline and jet fuel are a very small "slice" of the crude petroleum barrel. It is quite possible to have an adequate overall supply of products but extreme stringency for particular products.

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USSR INPUT PATTERN FOR PETROLEUM

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	-	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	5.0	4.0
Coal (000,000 mt)	2.0	.6
Petroleum (000,000 mt)		
Steel (000,000 mt)	0.7	2.8
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)	40	5.2
Motor transport (000,000,000 ton km)	0.9	2.9
Water transport (000,000,000 ton km)	49.0	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	77.6	30.2
Toluol (000 mt)	15.1	19.8
Phenol (000 mt)	2.8	5.4
Rubber (000 mt)	0	
Machine tools (000 units)	-	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	300	8.6
Coal mining machinery (units)	0	100
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	4.7	4.7
Trade (%)	1.5	1.5
Producing industries, nec		
Households-labor (000 man years)	310	.4
Inventory depletions	0	
Imports	0	

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Inputs

The petroleum industry is a large consumer of transportation, electric power, labor, and capital equipment. The equipment items are exploratory equipment, drilling machinery, refineries, tubing and pipelines. The capital equipment items of the petroleum industry are in short supply. The USSR is inexperienced in their manufacture and these products require large amounts of strategic resources.

Summary

The Soviet Bloc petroleum industry is a large, rapidly expanding industry with adequate reserves in the ground. The industry is on a sound technological basis. The supply of capital inputs is stringent but not crippling. Present production is adequate for cold war needs.

ELECTRIC POWER

The electric power industry in the Soviet Bloc plays a leading role in Soviet economic policy. Lenin's comment that "communism is Soviet rule plus the electrification of the whole country" has been followed consistently by Soviet planners since the Revolution.

The production of electric power is simply the provision of a secondary energy supply source having greater mobility and flexibility than does the primary or basic energy source. The basic energy sources are coal, petroleum, the pull of

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gravity, and the force of wind. In the Soviet Bloc coal is by far the most important present source of energy supplies. About 80 percent to 85 percent of electric power is generated from coal. Hydro-electric power is much greater in potential in the USSR, but its generation constitutes only 15 percent-¹⁸ percent of the total. Natural and manufactured gas, oil, wood and wood derivatives, and wind power are only a small percentage of the total.

Trends

The electric power industry has been one of the most rapidly expanding industries of the Soviet Bloc. Generation of electricity in the Bloc in 1951, amounted to about 157 billion kilowatt-hours as contrasted to about 75 billion kilowatt-hours in 1946. During the early 1930's, the annual rate of increase in output of electric power was about 25 percent declining to a low of 10 percent immediately prior to World War II. In the post war years, the average rate of increase in electric power generation has been about 15 percent. Expansion in the European Satellites has been at a somewhat lower rate, but the increases have been substantial.

The increases in output have resulted from substantial additions to capacity over the years. USSR capacity in 1920 was only about 1.2 million kilowatts, as against 5.6 million kilowatts in 1935, 10.5 in 1940, and by mid-1952 it will

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reach about 23.3 million kilowatts. Mid-1952, capacity, for the European Satellites will be about 16.1 million kilowatts.

Supply

Of a total of 181 billion kilowatt-hours which will be produced in the Soviet Bloc in 1952-1953, 124 billion kilowatt-hours, or 68 percent, comes from the USSR, with East Germany, the next largest country, producing 21 billion kilowatt-hours, or 12 percent of the total. The remainder of production is accounted for by Poland with 7 percent; Czechoslovakia with 6 percent; Hungary with 2 percent; Rumania with 1 percent; and China, with 3 percent of total Soviet Bloc generation.

Electric Power Generation

<u>Country</u>	<u>Billion KWH</u>	<u>% of Total</u>
USSR	124.00	68
East Germany	21.25	12
Poland	12.00	7
Czechoslovakia	11.50	6
China	5.00	3
Hungary	3.40	2
Rumania	2.80	1
Bulgaria	.93	*
Albania	.06	*
Total	180.94	100

* less than 1 percent.

In general, trade is not of great significance in the electric power industry. The North Korean Suiho plant has exported about 680 million kilowatt hours into Southern Manchuria.

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Some of the European Satellites, notably Rumania and Hungary, have made arrangements whereby their electric power resources would be interconnected and hence there would be transmission across international boundaries.

The USSR does not make such extensive use of huge integrated electric power systems as does the United States and Great Britain. There are some nine or ten main regional high tension networks in the USSR, but very little connection between them and no national grid. The most important power systems are the Moscow-Gorki, the Urals, the Dneiper-Donetz, and the Leningrad systems.

The plant factor, i.e., the relationship between actual generation and generation at rated capacity, is very high in the USSR. This reflects a conscious effort to suppress peak loads and to distribute electric power requirements over the day, week, and month in such a manner that huge standby capacity units are not necessary. The fact that industry is one of the largest consumers and that household consumption of electric power, which frequently gives rise to very high peak loads, is a relatively small proportion of total power consumption, means that a high plant factor can be achieved. The plant factor for the USSR is between .5 and .6. In the United States, the plant factor is between .4 and .5.

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In the European Satellites, on the other hand, it is necessary to make a distinction between installed capacity and operable capacity. The plant factor figured on operable capacity for the Satellites would be high. On installed capacity, which is in need of substantial repair and parts replacement, would be much lower. In general, the USSR and its Satellites are able and do attain higher plant factors than other parts of the world, largely through the regulation of the use of electric power.

Inventory

Electric power cannot be stored except by batteries or by pumping water so as to give it a head. These are high cost operations in which the Soviet Bloc does not engage.

Pattern of Demand

The most important characteristic of the use of output of electric power in the Soviet Bloc is the very high percentage which goes into industry and the relatively small proportion which is consumed by the household sector.

Whereas in the United States, less than 50 percent of the total power is allocated to industry, in the USSR, about 65 percent is so allocated, in East Germany, 62 percent, Poland, 66 percent, and in Czechoslovakia, 65 percent. Both the United States and Great Britain allocate nearly twice as much, proportionately, to household consumption as does the USSR.

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USSR USE PATTERN FOR ELECTRIC POWER
(000,000,000 KWH)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	5.0	4.0
Textiles	-	
Electric power	20.0	16.2
Coal	4.5	3.6
Petroleum	5.0	4.0
Steel	9.7	7.8
Copper	0.7	.6
Aluminum	6.0	4.8
Rail Transport	4.0	3.2
Motor Transport	0.1	.1
Water Transport	0	
Trucks	0.8	.6
Tractors	0.3	.2
Locomotives	0.1	.1
Rolling Stock	0.1	.1
Coke-chemicals	-	
Rubber	-	
Machine Tools	0.2	.2
Ball & Roller Bearings	0.1	.1
Heavy Motors & Generators	0.1	.1
Coal Mining Machinery	-	
Electron Tubes	-	
Merchant Shipbuilding	-	
Construction	-	
Mining, n.e.c.		
Machinery, n.e.c.	10.0	8.1
Trade	.5	.4
Consuming Industries, n.e.c.	34.8	28.1
Households	18.0	14.5
Defense	4.0	3.2
Army		
Navy		
Air		
Inventory Accretions	0	
Exports	0	
TOTAL OUTPUT	124.0	100.0

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Despite the already high allocation of electric power to industrial use and despite the high plant factor in the Soviet Bloc, there remains substantial flexibility in the use of electric power in the Soviet Bloc. This is not national flexibility, inasmuch as the regional grids are not interconnected. However, within any one grid, the use pattern may be so shifted about so as to achieve alternative objectives selected in the planning process.

Input Structure

The most important inputs into the electric power industry on current account are coal, electric power, petroleum, and labor. On capital account, aluminum (for high tension wire), industrial housing, heavy motors, and generators are the most important inputs.

There is no shortage of the basic energy resources for the electric power. The Soviet Bloc makes every effort to utilize low grade coals, thus releasing their high grade coal for other industrial purposes.

Heavy electrical equipment and wire for transmission are the determinants of the rate of growth of the industry. This machinery is difficult to build and the Soviet Bloc is making every effort to import motors and generators. The wire requires either copper or aluminum, both of which are strategic items.

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USSR INPUT PATTERN FOR ELECTRIC POWER

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	20.0	16.2
Coal (000,000 mt)	71.0	22.9
Petroleum (000,000 mt)	2.2	5.3
Steel (000,000 mt)	0	
Copper (000 mt)	90.0	30.0
Aluminum (000 mt)	30	9.8
Rail transport (000,000,000 ton km)	0	
Motor transport (000,000,000 ton km)	0.3	1.0
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	0	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	1400	39.4
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	4.6	4.6
Trade (%)	1.0	1.0
Producing industries, nec		
Households-labor (000 man years)	330	.4
Inventory depletions	0	
Imports	0	

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Summary

The Soviet Bloc is well supplied with primary energy resources for its electric power industry which is a rapidly expanding industry. There is a large hydro-electric power potential and coal is in adequate supply. The basic determinant of expansion is the availability of heavy electrical machinery and other capital equipment. The electric power industry is dominated in its use by industry and operates with a high plant factor.

S-E-C-R-E-TPART IV

E. METALS

With the exception of a brief period during World War II, the metals industries of the Soviet Bloc have been expanding. In general, this expansion has been at a relatively high rate, declining slightly over time, as higher levels of output are achieved. The post-war rates of expansion reflect the reactivation of war-damaged facilities.

Metals are a basic determinant of the rate of growth of the economy as a whole. It would be possible for the economy of the Bloc to grow even faster were it not for heavy allocations of metals to the military and the stockpiling program. However, since metals are only one ingredient of growth, it cannot be said that current metal use patterns alone are impeding the economic growth of the Bloc.

Soviet Bloc Metal Production

	<u>1938</u>	<u>1940</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>
<u>Raw Steel (000,000 mt)</u>						
Bloc	22.7	22.3	23.7	29.5	34.0	38.7
USSR	18.0	18.3	18.0	22.5	26.3	30.3
China	0.6	0.5		0.6	0.6	0.9
Czechoslovakia	1.8	2.4	2.5	2.6	2.7	2.9
East Germany			0.4	0.6	1.0	1.2
Hungary	0.6	0.8	0.7	0.8	0.8	0.8
Poland	1.4		1.9	2.2	2.3	2.3
Rumania	0.3	0.3	0.2	0.2	0.3	0.3

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	<u>1938</u>	<u>1940</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>
<u>Copper (000 mt)</u>						
Bloc						
USSR	103.2	161.0	237.0	261.9	284.2	296.1
China	0.5	2.3	0.5	260.0	275.0	285.0
Czechoslovakia			0.1	0.1	0.1	0.1
East Germany			6.4	9.0	9.1	11.0
<u>Aluminum (000 mt)</u>						
Bloc	58.3	86.4	206.4	215.5	239.6	282.0
USSR	56.8	78.2	197.0	201.5	221.6	260.0
China		5.0				
Hungary	1.5	3.2	9.4	14.0	18.0	22.0
<u>Molybdenum (mt)</u>						
Bloc				1230	1370	1550
USSR			780	900	1370	1550
China				350	450	450
<u>Tungsten (000 mt)</u>						
Bloc				7.0	7.8	8.8
USSR				1.8	2.1	2.6
China	7.3	4.8		5.2	5.7	6.2
						7.6
<u>Nickel (000 mt)</u>						
USSR (Bloc)	3.0	11.0	25.0	25.0	27.5	29.0
<u>Cobalt (mt)</u>						
USSR (Bloc)			800.0	850.0	900.0	950.0
<u>Tin Plate (mt)</u>						
Bloc	80.3		153.7	191.4	222.2	254.0
USSR	71.0		132.0	167.0	195.0	225.0
Czechoslovakia	6.8		7.6	7.9	8.2	8.6
Poland	10.0		11.8	14.0	16.3	17.0
Rumania	2.5		2.3	2.5	2.7	3.4
<u>Platinum (000 troy ounces)</u>						
USSR (Bloc)	120.0	110.0	125.0	120.0	100.0	95.0
<u>Antimony (000 mt)</u>						
Bloc	8.6	12.7	4.9	7.8	10.8	12.8
USSR					2.8	2.8
China	7.8	8.5	3.3	6.0	6.0	8.0
Czechoslovakia	0.8	4.2	1.6	1.8	2.0	2.0

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	<u>1939</u>	<u>1940</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>
<u>Mercury (000-76LB. flasks)</u>						
Bloc	14.3				29.4	
USSR	8.7				28.0	
China	2.7	4.3			0.5	
Czechoslovakia	2.9	2.6	0.8	0.8	0.9	
<u>Tin (000 mt)</u>						
Bloc	12.8	12.4	11.2	11.6	13.3	15.0
USSR	11.0	1.7	6.3	7.3	8.3	9.0
China	11.8	10.7	4.9	4.3	5.0	6.0
<u>Fluorspar (000 mt)</u>						
Bloc	120.0	126.2	131.5	163.8	188.6	185.5
USSR	75.0	85.0	100.0	125.0	150.0	150.0
East Germany	45.0	41.2	31.5	38.8	38.6	35.5
<u>Zinc (000 mt)</u>						
Bloc	185.0	217.4				
USSR	78.0	86.1	81.0	103.0	100.0	105.0
Czechoslovakia	8.9	10.3				
Poland	108.1	120.0	87.1	92.0	100.6	118.0
<u>Lead (000 mt)</u>						
Bloc	101.8	104.3	104.0	119.1	131.6	138.9
USSR	69.0	75.0	76.4	90.1	100.0	100.0
China	2.0	2.7	0.8			6.0
Czechoslovakia	5.0	3.5	5.8	7.0	7.6	8.7
Hungary	0.1		0.1			0.2
Poland	20.0	23.0	16.9	18.0	20.0	20.0
Rumania	5.7	0.1	4.0	4.0	4.0	4.0

Iron and steel, copper, and aluminum are substantial consumers of nearly all the strategic resources of the economy. The following table lists these inputs and the percentage of total production of the input consumed by metals.

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USSR INPUT PATTERN FOR METALS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 kwh)	16.4	13.2
Coal (000,000 mt)	61.5	19.8
Petroleum (000,000 mt)	3.7	8.9
Steel (000,000 mt)	4.4	17.6
Copper (000 mt)	3.6	1.2
Aluminum (000 mt)	14.0	4.6
Rail transport (000,000,000 t/km)	120.0	15.6
Motor transport (000,000,000 t/km)	1.2	3.9
Water transport (000,000,000 t/km)		37.8
Trucks (000 2-ton units)	0	
Tractors (000 15-hp units)	0	
Locomotives (units)	0	
Rolling stock (000 2-axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	-	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 kw)	520.0	14.7
Coal mining machinery (units)	0	
Electron tubes (000,000 US\$)	0	
Mechant shipbuilding (000 GRT)	0	
Construction (%)	10.6	10.6
Trade (%)	7.5	7.5
Producing industries, nec		
Households-labor (000 manyears)	1,070.0	1.2
Inventory depletions		
Imports		

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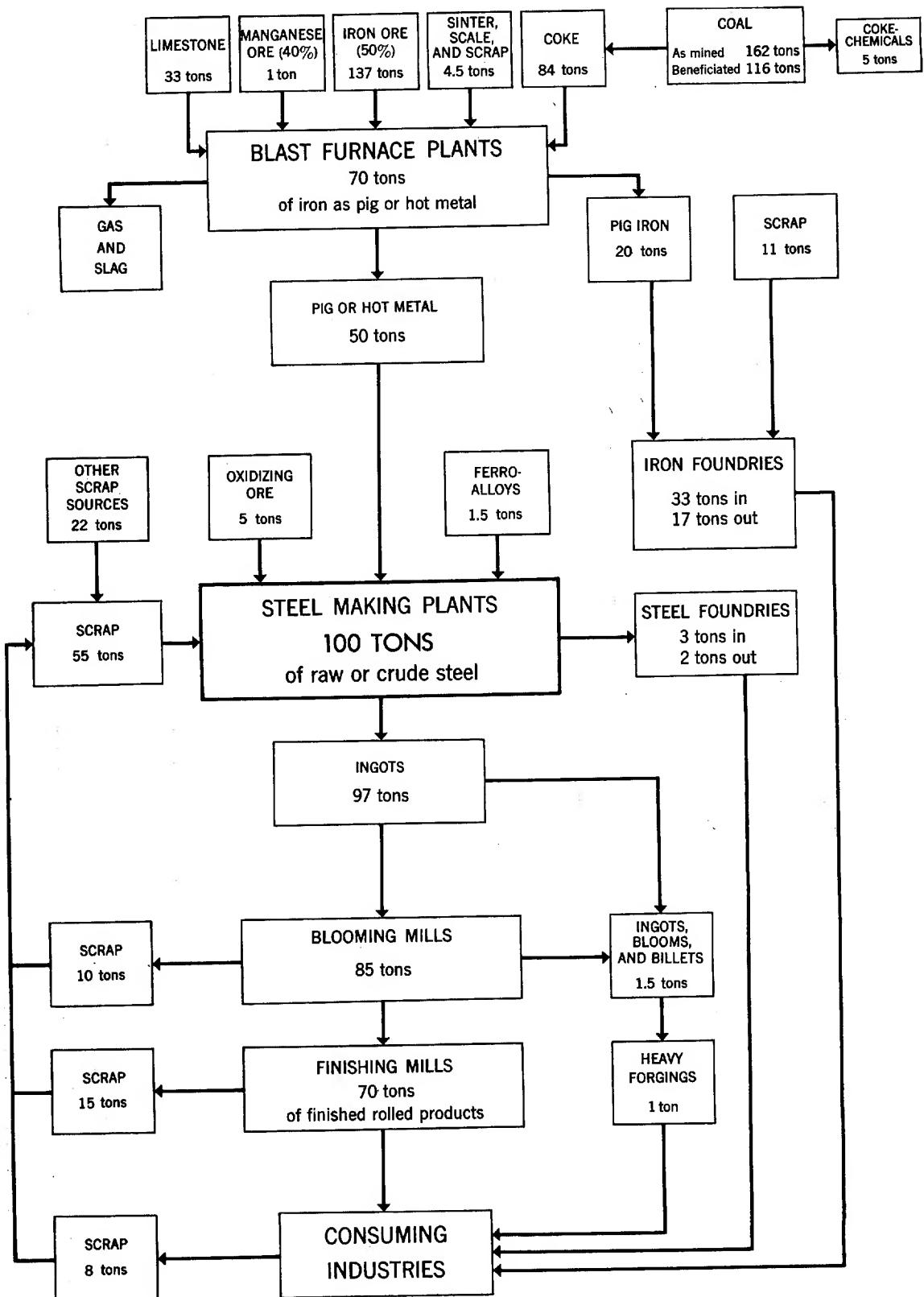
S-E-C-R-E-TIron and Steel Industry

The iron and steel industry may be logically divided into three stages: (1) production and assembly of raw materials; (2) processing of raw materials into raw steel, and (3) production of finished steel products. The first stage embraces mining, quarrying and collective operations to provide iron ore, coal, limestone and scrap which are the primary raw materials of the industry. In the second phase coal is carbonized into coke in ovens; iron ore is reduced to pig iron in the blast furnace; and scrap and pig iron are refined into steel in the open hearth, Bessemer and electric furnaces. The liquid steel is cast into molds to produce castings or ingots. In the final stage the ingots are rolled or forged into two general classes of products: (1) semi-finished and (2) finished. Semi-finished consists of blooms, billets, slabs and sometimes skelp rolled on primary mills. Finished products include plates, strip, sheets, bars, structural shapes, pipes and tubes, rails and tin plate all of which are made on finishing rolling mills. forgings and castings, while not rolled items, also are classed as finished products.

After manufacture, the steel products are distributed to the consuming industries in numerous ways.

The accompanying chart presents a graphic picture of the flow of materials in the USSR iron and steel industry and reveals the average quantities of raw materials required to produce one hundred tons of raw steel and the average distribution of raw steel in subsequent stages of processing.

FLOW OF MATERIALS IN USSR IRON AND STEEL INDUSTRY *



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Trends

The over-all growth rate for the iron and steel industry in the Soviet Bloc has been approximately 10 to 14 percent per year for the postwar years. For the period 1 July 1952 to 1 July 1953, raw steel production in the USSR will be 34.7 million tons and for the Soviet Bloc 43.9 million tons as compared to raw steel production in 1938 of 18.1 and 24.0 million tons respectively.

The growth of the industry during this period has not been continuous. During the war years a substantial portion of the USSR iron and steel industry was destroyed and overrun. Likewise, successive occupation by the Germans and the Russians interrupted Satellite steel production. Following 1945, the USSR steel industry was rebuilt very rapidly and by 1949 the prewar levels of output had been attained. The USSR steel industry is currently expanding at the rate of approximately 3 million metric tons per year. This growth comes from three sources, (a) new plants are being built, (b) existing plants are increasing their capacity for making steel, and (c) the USSR has, in recent years, demonstrated an ability to use their existing plants and plant facilities more efficiently.

Stalin has stated that current plans provide for the production of 60 million tons of raw steel in 1960. These ambitious plans seem to be feasible since maintenance of the 1947-1951 growth rate would result in production in the USSR in 1960 of slightly less than the planned 60 million tons, while the Fifth Five Year Plan

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provides for production in 1955 of about 42.6 million tons. If the other Soviet Bloc countries progress at the same rate, the Soviet Bloc as a whole would have by 1960 a raw steel output of about 75 million metric tons. At the present time the Soviet Bloc is producing at about one third the rate of current (1951) output of the United States, while 1960 planned Soviet Bloc production will amount to about 60% of the current (1951) output of the United States.

Supply

The Soviet Bloc economy will have available to them nearly 44 million metric tons of raw steel between 1 July 1952 and 1 July 1953, of which 79% is produced in the USSR. This amount of raw steel reduces to 31.6 million metric tons of finished steel products for the Soviet Bloc, and 25.0 million metric tons of finished steel products for the USSR.

Soviet Bloc Steel Supply, 1952-1953
(millions of metric tons)

	Sov. Bloc	USSR	China	Czech.	E. Germany	Poland
Supply	43.9	34.7	1.0	2.9	1.7	2.6
Production	43.9	34.7	1.0	2.9	1.7	2.6
Imports	---	---	---	---	---	---
Exports	---	---	---	---	---	---
Inventory	0	0	0	0	0	0
Finished Steel Fr.	31.6	25.0	0.7	2.1	1.2	1.9

The USSR steel products supply is indicated in the following table. More than one fourth is in the form of light sections, small billets, and bars, much of which is consumed directly in the various

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engineering industries, in the fabrication of machine parts, and in building construction. Ingots, blooms, heavy billets, and slabs are customarily an intermediate stage in steel processing and are often made or forged in the plant where they are subsequently converted into some other steel product. Sheet is used in oil drums, car bodies, packaging materials, roofing, and in small machine parts. The distinction between plate and sheet is somewhat arbitrary; plates, which are thicker than sheets, are used in the engineering industries, shipbuilding and in the manufacture of armored vehicles.

The distribution of steel products by type varies in the different countries, however, considering the relative size of the industry in Czechoslovakia, East Germany, Hungary, Poland and Rumania, this variation is not likely to cause the distribution for the Soviet Bloc to significantly depart from the USSR distribution.

USSR Steel Plant Products by Type, 1952-1953		
	%	000 tons
Total	100	25,000
Ingots, blooms, heavy billets and slabs	16	3,940
Heavy rails and accessories	8	2,050
Plate	9	2,180
Heavy sections	3	640
Light sections, small billets, and bars	26	6,460
Hot rolled strips	3	780
Wire rods	7	1,800
Cold rolled strip	2	420
Bright steel bars	1	220
Sheet	10	2,740
Tin, terne and black plate	1	280
Tubes, pipes and fittings	6	1,550
Wire	1	200
Tires, wheels and axles	3	830
Steel forgings	2	430
Steel castings	2	480

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The Soviet Bloc's iron and steel industry consists of about 240 plants of which 160 are in the USSR. In the USSR the small plants, 85% of the total number, produce only about 26% of the total output of the industry. On the other hand the nine largest plants in the USSR produce over 47% of total output.

While trade is not quantitatively an important element in the iron and steel industry of the Soviet Bloc, the USSR, Czechoslovakia, Hungary and Poland import iron ore from Sweden. The USSR imports steel products from its European Satellites, and the USSR exports pig iron to these Satellites.

The USSR is the largest producer of steel in the Soviet Bloc accounting for about 79 percent of Soviet Bloc production, with the European Satellites accounting for 19 percent and China 2 percent of the remainder.

Inventories

There is no inventory of iron and steel in the Soviet Bloc. There are substantial working stocks, in the form of ores and coal at the first stage of production; pig iron, raw steel ingots, various types of semi-finished steel products held in storage, and steel products in the hands of final consumers. This pipeline supply is substantial, probably between 25 percent and 40 percent of annual production.

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The Pattern of Demand

The pattern of demand for steel in the Soviet bloc reflects the rapid industrialization of the Bloc economies and the high priorities given to military end items. About 25 percent of all steel products goes into the manufacture of various kinds of machinery. Nearly 14 percent is plowed back into the iron and steel industry, both in order to maintain the existing facilities and for the industry's further expansion. Transportation equipment, including rails, consumes about 25 percent. Construction, chiefly industrial housing, consumes about 17 percent, while the manufacture of all kinds of military end items, such as naval vessels, armored combat vehicles, tanks, and self-propelled guns, artillery pieces and other items, uses slightly more than 10 percent of finished steel products.

Since opportunities to substitute for steel are severely limited (light metals in some uses, and wood in construction), the consumption pattern of steel in terms of large groups of industries is relatively stable over a prolonged cold war situation. It is possible to increase the amount going to the military sector, but only at the expense of failing to build as solid an industrial base for the economy as is possible. A shift of steel to the military sector will be at the expense of each of the other sectors. The hardest hit would probably be the construction sector.

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USSR USE PATTERN FOR STEEL
(000,000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	0	
Textiles	0	
Electric power	0	
Coal	0	
Petroleum	0.7	2.8
Steel	3.4	13.6
Copper	0	
Aluminum	0	
Rail Transport	2.1	8.4
Motor Transport	0.4	1.6
Water Transport	0	
Trucks	1.2	4.8
Tractors	0.7	2.8
Locomotives	0.6	2.4
Rolling Stock	1.3	5.2
Coke-chemicals	0	
Rubber	0	
Machine tools	0.2	.8
Ball and roller bearings	0.2	.8
Heavy motors and generators		
Coal mining machinery	0.1	.4
Electron tubes	0	
Merchant shipbuilding	0.1	.4
Construction	4.2	16.8
Mining, nec	1.0	4.0
Machinery, nec	4.8	19.2
Trade	0	
Consuming industries, nec	1.4	5.6
Households	2.6	10.4
Defense		
Army		
Navy		
Air		
Inventory accretions	--	
Exports	--	
TOTAL OUTPUT	25.0	100.0

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On balance, it appears that while steel is economized stringently and its allocation is done with considerable care, a shortage of steel will not prevent the USSR from achieving its planned goals. However, it is clear that more steel would enable the economy of the USSR to expand at an even faster rate. In an expanding economy, steel is one of the critical elements which determines the rate of expansion of industry, and its scarcity imposes a ceiling on industrial capacity.

The use of steel products in the Soviet Bloc is in general similar to that of the USSR. There is probably less steel going into the manufacture of military end items since the USSR prefers to predominate in the manufacture of large pieces of equipment, with the Satellites frequently making components which consume relatively less steel. The emphasis in the European Satellites upon the building of an industrial base suggests that a high proportion of steel products is used in machinery, equipment, construction, and transportation equipment.

Input Structures

Since the iron and steel industry is a multi-stage operation, only by breaking the industry down into its stages and determining the inputs into each industry and the allocation of its outputs to the next stage could a completely accurate input structure be determined. The following table is an inadequate description of the complexity of the inputs and the technological cost structure.

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USSR INPUT PATTERN FOR STEEL

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	9.7	7.8
Coal (000,000 mt)	60.0	19.3
Petroleum (000,000 mt)	3.7	8.9
Steel (000,000 mt)	3.4	13.6
Copper (000 mt)	3.6	1.2
Aluminum (000 mt)	14	4.6
Rail transport (000,000,000 ton km)	100	13.0
Motor transport (000,000,000 ton km)	0.6	1.9
Water transport (000,000,000 ton km)		37.8
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	--	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	400	11.3
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	6.8	6.8
Trade (%)	4.5	4.5
Producing industries, nec		
Households-labor (000 man years)	920	1.0
Inventory depletions	0	
Imports	0	

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of the iron and steel industry. Iron ore, manganese ore, limestone, various fluxes, coal, electric power and manpower are the basic current production ingredients of the iron and steel industry. The capital inputs are many and varied, including rolling mills and rolling mill equipment, blast furnaces, open-hearth furnaces, forges, and other heavy metallurgical machinery and equipment.

Steel is the largest single consumer of coal, a substantial consumer of electric power and rail transportation, and is probably the largest industrial enterprise in terms of its manpower requirements.

Summary Statement

The iron and steel industry in the Soviet Bloc, under cold war conditions, will operate at levels during 1952 and 1953, which are adequate for the maintenance of a sound industrial economy and will permit expansion of the industrial base. The availability of steel to other industries including those which are responsible for rearmament, will be sufficient and no lack of important inputs will impair operations of the iron and steel industry.

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Copper Industry in the Soviet Bloc

The copper industry consists of (1) mining copper ores, (2) milling the ores to make concentrates, (3) smelting the concentrates and scrap copper to make blister (crude) copper, (4) purifying the blister copper to make refined copper, (5) forming, rolling, and extruding the refined copper to make basic forms and shapes.

Trends

The Soviet Bloc copper industry is a relatively small industry with an output about one-third that of the United States copper industry. With the exception of 1944, Soviet Bloc copper production has continually expanded, output virtually doubling in the postwar period, 1945-1951. Some of the expansion in the industry in the postwar period was made possible by the rehabilitation of plants and mines which were inoperable during the war. The Fifth Five Year Plan for the copper industry provides for a substantial increase in the current growth rate of the industry. While achievement of the planned 1955 production of something over 500,000 metric tons in the USSR is unlikely, the diversion of resources to this effort will result in a substantial expansion of the industry over the next few years.

Supply

The total availability of copper for the Soviet Bloc from 1 July 1952 to 1 July 1953, will be 550,000 metric tons of which

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two-thirds will be produced, 10 percent will be imported, and the remainder will have been carried over from previous years in the form of stockpiles. In the USSR there will be about 40 thousand metric tons of production from scrap.

Soviet Bloc Copper Supply 1952-1953
(000 metric tons)

	Soviet Bloc	USSR	China	E.Sat.	E.Germany	Czech.
Total Availability	663	558	3	102	25	37
Current Supply	413	308	3	102	25	37
Production	355	300	3	52	20	2
Imports	58	8	0	50	5	35
Exports	0	0	0	0	0	0
Stockpile 1 July 1952	250	250	0	0	0	0

The Soviet Bloc is currently making strenuous efforts to import copper. The USSR imports from Finland, and the Satellites import principally from Chile. The Western economic warfare measures have forced much of the copper trade into clandestine channels, and round about methods of delivery, and have brought about abnormally high payments for copper imports into the Soviet Bloc. It is unlikely that the Bloc will be able to increase its imports substantially in the face of these Western restrictions.

The USSR accounts for about 77 percent of current copper supply and about 90 percent of production. Both smelting and refining activities are concentrated in a small number of plants. There are about 14 smelters and 5 refineries. The USSR is continuing to build new plants, such as the one at Almalyk and they are also expanding existing facilities at such locations as Balkash, already

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a large plant. The USSR has the only inventory, amounting to slightly more than 80 percent of current USSR production. The European Satellites account for 85 percent of copper imports, 23 percent of current supply and 12 percent of production.

Inventory

In the postwar years, the USSR has accumulated a substantial stockpile of copper. The copper is kept not only in its native form but also in stockpiles of copper products such as in wire.

Pattern of Demand

The cold war demands for copper are relatively inflexible, and the supply of 308,000 metric tons is used primarily in electric wire and cable (40%) and in the manufacture of munitions and military end items (20%).

The possibilities for cutting the demand for copper are limited. The armed forces demand could be cut about in half by the large scale substitution of steel for copper in large caliber (artillery) shell casings. There is some evidence that such substitution is being made on a small scale. On balance, some economizing of copper is possible in the military sector under cold war demands.

The demands on copper by the electric power industry are for transmission lines, distribution networks, housewiring, and so forth. Since most of the expansion in power facilities is scheduled for industrialized areas that support strategic sectors of the economy, it is not likely that this demand could be reduced by any significant amount.

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USSR USE PATTERN FOR COPPER
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	0	
Textiles	0	
Electric power	90.0	30.0
Coal	0	
Petroleum	0	
Steel	3.6	1.2
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	2.0	.7
Tractors	4.0	1.3
Locomotives	4.0	1.3
Rolling Stock	2.0	.7
Coke-chemicals	0	
Rubber	0	
Machine tools	0.8	.3
Ball and roller bearings	0.4	.1
Heavy motors and generators	3.0	1
Coal mining machinery	0.5	.2
Electron tubes	0	
Merchant shipbuilding	1.0	.3
Construction	25.0	8.3
Mining, nec	--	
Machinery, nec	30.0	10.0
Trade	0	
Consuming industries, nec	14.7	4.9
Households	29.0	9.7
Defense	60.0	20.0
Army		
Navy		
Air		
Inventory accretions	30.0	10.0
Exports	--	
TOTAL OUTPUT	300.0	100.0

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It is possible to substitute aluminum for copper on high tension transmission lines (but not in distribution networks and housewiring). Some such substitution is undoubtedly going on at the present time in the USSR as it is in the United States. However, since both of these metals, copper and aluminum, are considered to be of strategic importance, and their allocation carefully planned, there is no clear indication that a substitution of aluminum for copper would relieve the over-all critical metals situation. However, some of the construction demands for copper can be eliminated, household consumption can be compressed, and in a critical situation, copper could be diverted from the substantial USSR stockpile of copper.

On balance, while copper is in short supply in the Soviet Bloc, the current rate of production, plus imports and stockpiles, will be sufficient to permit overall achievement of the planned growth of the Soviet Bloc economy.

The copper supply of China and the European Satellites is distributed among its users in much the same way as is the case in the USSR.

Inputs into the Copper Industry

The most important inputs into the industry, on a current production basis are the copper ores, manpower, coal, electric power, steel, and cresylic acid. These inputs account for approximately 90 percent of the total production inputs. In addition to

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USSR INPUT PATTERN FOR COPPER

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	0.7	.6
Coal (000,000 mt)	0.5	.2
Petroleum (000,000 mt)	--	
Steel (000,000 mt)	0	
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)		
Motor transport (000,000,000 ton km)	0.3	1.0
Water transport (000,000,000 ton km)		
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	0	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 kw)	--	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	1.8	1.8
Trade (%)	1.5	1.5
Producing industries, nec		
Households-labor (000 man years)	50	.1
Inventory depletions	0	
Imports	8.0	

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flow requirements the industry has substantial requirements for mining machinery, transport equipment at the mines, smelters, furnaces, and refinery equipment. Industrial housing and its maintenance is an important capital input. None of the inputs into the copper industry is in critically short supply. There is no reason to believe that the functioning of the industry will be impaired by a lack of material or equipment input requirements.

Inputs into Copper in the Soviet Bloc: 1952-53

Input	Sov. Bloc	USSR	China	E. Satellites
Labor (man years)	62,500	50,000	500	12,000
Steel (mt)	31,250	25,000	250	6,000
Coal (mt)	625,000	500,000	5,000	120,000
Power (000 kwh)	877,000	700,000	7,000	170,000

Summary

While additional copper supplies would facilitate the accomplishment of Bloc plans, the present copper supply will permit the Bloc to maintain its industrial system, produce military end items in expected quantities, and expand their economies as planned.

The Soviet Bloc Aluminum Industry

The aluminum industry consists of facilities for (1) the mining and initial processing of bauxite and other aluminum ores, (2) the treatment of these ores by a combined chemical and heat process to make alumina (aluminum oxide), (3) the electrolytic reduction of the alumina to metallic aluminum, and (4) the rolling, extruding, alloying and casting of aluminum products.

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The industry did not begin in the USSR until 1933 when the Volkov plant near Leningrad went into operation. By 1938 the USSR was the world's third largest producer of aluminum, led by the US and Germany. Since the end of World War II, the USSR and Bloc production has about doubled. Currently, Canada is producing almost twice as much and the US three times as much aluminum as does the USSR.

Trends

Aluminum production in the USSR has expanded rapidly since 1933. The Fifth Five Year Plan is quite ambitious, providing for an output of 575,000 tons in 1955 or 260 percent of 1950 production. Achievement of this goal will require growth rates nearly double those achieved in the past. It is not likely that the plan will be fulfilled. In 1955 production will probably be between 375 and 425 thousand metric tons. In any case the Soviet Bloc has demonstrated clearly its ability to expand the aluminum industry substantially year to year and expansion is expected to continue.

Supply

Between 1 July 1952 and 1 July 1953 the Soviet Bloc will have available slightly more than 700 thousand metric tons of aluminum. Half of this amount will be provided by current production and the other half is accounted for by the USSR stockpile. Scrap collection, which is assumed to be approximately parallel to the US, is about 30 percent of production and about 22 percent of total supply

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for the Soviet Bloc as a whole. However, aluminum produced from scrap is not substitutable in some strategic uses for pure aluminum. In spite of the Bloc's effort to import aluminum and aluminum products, these imports amount to only about 3 percent of total aluminum supply. The USSR, East Germany, and Hungary are the only important Bloc producers of aluminum, accounting for 87 percent, 4 percent, and 9 percent, respectively, of total production. Poland and Czechoslovakia apparently plan to produce aluminum in significant quantities by 1955, but at present their needs are met by the USSR. The aluminum industry in the USSR is located primarily in nine plants scattered over the nation. In most cases, the alumina reduction plant and the aluminum production plant are adjacent.

Soviet Bloc Aluminum Supply 1952-1953
(thousands of metric tons)

	<u>Soviet Bloc</u>	<u>USSR</u>	<u>E.Germany</u>	<u>Hungary</u>
Total Supply	361	310	17	29
Primary Production	270	235	10	25
Scrap Collection	81	72	7	2
Non-Bloc Imports	10	3	2	2
Non-Bloc Exports	0	0	0	0
Inventory 1 July 1952	350	350	0	0
Inventory 1 July 1953	400	400	0	0

The Bloc produces about 1,600,000 tons of bauxite of which 1,000,000 tons is mined in Hungary. Hungary exports about 800,000 tons to the USSR.

Inventory

The USSR maintains a substantial stockpile of aluminum. The USSR, which had no aluminum stockpiled at the end of World War II,

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USSR USE PATTERN FOR ALUMINUM
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	0	
Textiles	0	
Electric power	30	9.8
Coal	0	
Petroleum	0	
Steel	14	4.6
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	2	.7
Water Transport	0	
Trucks	10	3.3
Tractors	2	.7
Locomotives	4	1.3
Rolling Stock	4	1.3
Coke-chemicals	0	
Rubber	0	
Machine tools	1	.3
Ball and roller bearings	--	
Heavy motors and generators	--	
Coal mining machinery	--	
Electron tubes	0	
Merchant shipbuilding		
Construction	12	3.9
Mining, nec	--	
Machinery, nec	30	9.7
Trade	0	
Consuming industries, nec	23	7.5
Households	35	11.4
Defense	100	32.5
Army	15	4.9
Navy	25	8.1
Air	60	19.5
Inventory accretions	40	13.0
Exports	--	
TOTAL OUTPUT	307	100.0

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has been reserving a substantial portion of production to a strategic stockpile which by mid-1952 amounted to 350,000 metric tons, somewhat more than a year's production! In the year ending 1 July 1953, a further 40,000 tons will be added to the stockpile.

Pattern of Demand

The most important single use for aluminum in the Soviet Bloc is in the manufacture of aircraft. Nearly a third of the aluminum is used in military end-items, including aircraft. About 13 percent goes to stockpile which has a very high priority in the USSR. The remainder is divided up among many uses, the more important of which are transportation equipment, electric power transmission, and in household goods of various kinds.

The demands for aluminum and aluminum products are subject to considerable variations. Many of the demands can be cut severely simply by elimination of the products using aluminum or by substituting other metals (such as steel or wood) in those products.

Since aluminum is itself a substitute for other metals in some uses, such as copper in electrical conductors, and requirements (including stockpile) for rearming economies are substantial, it cannot be said that aluminum is abundant. However, the diversion over a period of years by the USSR of substantial quantities of aluminum to stockpile is an indication that the USSR produces sufficient aluminum to provide for planned economic expansion.

On balance, while aluminum is not in short supply, its allocation is done in such a fashion as to provide only that which is

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USSR INPUT PATTERN FOR ALUMINUM

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	6.0	4.8
Coal (000,000 mt)	1.0	.3
Petroleum (000,000 mt)	--	
Steel (000,000 mt)	0	
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)		
Motor transport (000,000,000 ton km)	0.3	1.0
Water transport (000,000,000 ton km)		
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	0	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	--	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	2.0	2.0
Trade (%)	1.5	1.5
Producing industries, nec		
Households-labor (000 man years)	100	.1
Inventory depletions	0	
Imports	3.0	

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necessary for the efficient operation of an expanding economy, with the remainder going to stockpile. This stockpile can act as a cushion for shortrun shortages in particular uses without affecting the overall total significantly.

Input Structure

Aside from the ore, and in its processed form - alumina, the most important inputs are coal (for heat treatment of bauxite in making alumina and in making carbon electrodes for the electrolysis of aluminum), electric power for the electrolytic reduction of alumina to aluminum, caustic soda, (about 250,000 tons in the USSR), and manpower. These inputs probably account for more than 90 percent of the total production inputs on current account. In addition, there is a transportation requirement, for transferring the ore to the reduction works. In most cases the aluminum reduction plant is adjacent to the electrolytic plant, but even so there is transportation required for the aluminum ingots and for aluminum products to their markets. In addition, there are substantial inputs of capital in the form of electrolytic baths and material handling equipment.

Most of these inputs are in adequate supply for the efficient operation of the industry at capacity level. Electric power, which is needed in huge quantities at a low rate per kilowatt hour and in a steady, unbroken flow, will limit expansion of the industry. Much of the electric power is hydro-generated and the streams from

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which the power is manufactured are not sufficiently stable so as to insure year-round steady output of electricity. Lack of electricity probably accounts for most of the 20 percent under capacity utilization of aluminum plants. Nevertheless, there is sufficient electric power to permit the industry to maintain its output at a high level.

Summary

Under cold war conditions the supply of aluminum and aluminum products is adequate to meet the needs of the economy and to maintain planned production of military end-items, notably airplanes. In spite of the substantial amounts of aluminum going to stock-piles, the lack of aluminum will not deter the expansion of Soviet Bloc economies and no important user will be deprived of sufficient aluminum to meet his plans in quantity and quality.

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PART IV

F. CHEMICALS

The chemical industry of the USSR is relatively new; and has developed at a rapid rate since 1925. During the late 1930's, near self-sufficiency was achieved in many of the most important chemicals. During the war, much of the pre-war plant which was located west of the Urals and in Moscow and Leningrad areas, was seriously damaged or lost. Since the war the USSR has reconstructed its chemicals industry with great vigor and on a more stable technological base. Similarly, the Soviet Bloc, as a whole, has a large and expanding chemicals industry. East Germany is by far the most important Satellite producer of chemicals. Many of the "trick" chemical products; that is, those involving complicated and difficult processes, are manufactured in East Germany.

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Production of Selected Chemicals in the Soviet Bloc
(000 metric tons)

	<u>1938</u>	<u>1940</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>
Sulfuric acid						
Bloc	-	-	2,586	3,158	3,718	4,278
USSR	1,600	2,000	1,950	2,340	2,800	3,250
Eur. Satellites	-	-	636	818	918	1,028
Nitric acid						
Bloc	-	-	649	775	895	994
USSR	177	232	590	655	715	760
E. Germany	-	-	59	120	180	234
Caustic soda						
Bloc			318	403	452	517
USSR	126	185	190	241	277	300
E. Germany	-	-	110	136	149	184
Hungary	3	-	4	6	6	9
Romania	14	-	14	20	20	24
Synthetic ammonia						
Bloc	-	-	676	786	846	902
USSR	255	340	440	489	534	550
Czechoslovakia	25	-	22	26	28	32
E. Germany	-	-	180	230	236	265
Poland	-	-	34	41	48	55
Chlorine						
Bloc	-	-	241	300	352	420
USSR	85	105	135	170	205	235
E. Germany	-	-	106	130	142	177
Hungary	-	-	-	-	5	8
Calcium carbide						
Bloc	-	-	-	-	1,102	1,198
USSR	80	120	-	200	233	267
Czechoslovakia	-	-	51	-	68	68
E. Germany	-	-	412	529	628	678
Poland	-	-	153	162	173	185

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USSR INPUT PATTERN FOR CHEMICALS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	1.0	1.1
Meat 000,000 mt	0	
Fats and oils 000 mt	0	
Cotton 000 mt	90.0	9.3
Wool 000 mt	0	
Hemp 000 mt	-	
Electric power 000,000,000 kwh	-	
Coal 000,000 mt	1.0	.3
Petroleum 000,000 mt	-	
Steel 000,000 mt	0	
Copper 000 mt	0	
Aluminum 000 mt	0	
Rail transport 000,000,000 t/km	-	
Motor transport 000,000,000 t/km	-	
Water transport 000,000,000 t/km	0	
Trucks 000 2-ton units	-	
Tractors 000 15-hp units	0	
Locomotives units	0	
Rolling stock 000 2-axle units	0	
Refined benzol 000 mt	141.5	55.0
Toluol 000 mt	28.4	37.1
Phenol 000 mt	37.6	72.7
Rubber 000 mt	*	
Machine tools 000 units	0	
Ball and roller bearings 000,000 units	0	
Heavy motors and generators 000 kw	-	
Coal mining machinery units	0	
Electron tubes 000,000 US\$	0	
Merchant shipbuilding 000 GRT	0	
Construction %	0	
Trade %	-	
Producing industries, nec		
Households-labor 000 manyears	275.0	.3
Inventory depletions		
Imports		

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COKE CHEMICALS

Coke chemicals are one of the most important groups of chemical products since they are essential ingredients in the manufacture of various kinds of high explosives, high octane aviation gasoline, and certain types of synthetic rubber.

The most important coke-chemical products are benzol, toluol, xylol, naphthalene, phenol, cresol, and other coal derivatives which are made from the gases, oils, and tars which result from the destructive distillation of coal. In addition, some production comes about as a by-product of petroleum distillation. The coke-chemical industry in the Soviet Bloc is well developed. It is concentrated primarily in the Soviet Union, Poland, and Czechoslovakia.

Production of coke-chemicals is entirely a by-product process in the manufacture of coke, the distillation of petroleum or the hydrogenation of coal. The technology of the industry is mobile and may change radically in the next decade.

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S-E-C-R-E-TTrends

The following table indicates the production trends of three important coke-chemicals in the Soviet Bloc.

Production of Coke-Chemicals in the Soviet Bloc (000 metric tons)						
	1938	1940	1948	1949	1950	1951
Refined Benzol						
Bloc	-	-	184	217	274	314
USSR	156	177	112	131	171	200
Czechoslovakia	-	-	37	41	48	53
Poland	-	-	35	45	55	61
Toluol						
Bloc	-	-	34	41	54	63
USSR	38	43	27	32	42	49
Czechoslovakia	-	-	5	6	7	8
Poland	-	-	2	3	5	6
Phenol						
Bloc	-	-	7.7	9.2	11.5	13.1
USSR	7.3	8.2	5.2	6.0	8.0	9.3
Czechoslovakia	-	-	2.0	2.5	2.7	2.8
Poland	-	-	0.5	0.7	0.8	1.0

S-E-C-R-E-TSupply

The supply situation for the most important coke-chemicals for 1952-1953 is shown below:

Soviet Bloc Supply of Coke-Chemicals, 1952-1953
(000 metric tons)

<u>Product</u>	<u>Bloc</u>	<u>USSR</u>		<u>European Satellites</u>	
		<u>Quantity</u>	<u>% of Bloc</u>	<u>Quantity</u>	<u>% of Bloc</u>
Benzol, refined	402.6	257.0	64	145.6	36
Toluol	97.1	76.3	79	20.8	21
Xylol	32.0	26.9	84	5.1	16
Phenol	67.2	51.7	77	15.5	23
Naphthalene	109.3	55.8	51	53.5	49
Crescels	29.6	18.6	63	11.1	37

Nearly all the coke-chemical supply of the Soviet Bloc is from indigenous production. Small amounts of xylol and naphthalene are imported from the Netherlands, Sweden, and Italy. The USSR produces about 70 percent, on a quantity basis, of all coke-chemicals in the Soviet Bloc.

Inventory

About 10 percent of domestic production of coke-chemicals of the USSR have been stockpiled since 1947. The following gives the 1951, 1952, and 1953 Soviet stockpile of major coke-chemicals.

Estimated USSR Stockpiles 1951 - 1953
(metric tons)

	<u>1951</u>	<u>1952</u>	<u>1953</u>
Benzol, refined	70,535	93,535	118,735
Toluol	22,650	29,650	37,280
Naphthalene	15,530	20,630	26,210
Phenol	14,580	19,230	24,320

S-E-C-R-E-TPattern of Demand

The overall allocation of coke-chemical products among consumption, exports, and inventory accretions is shown below:

Soviet Bloc Allocation of Coke-Chemicals, 1952 - 1953
(000 metric tons)

<u>Product</u>	<u>Current Domestic Consumption</u>	<u>Foreign Exports</u>	<u>Inventory Increase</u>	<u>Total</u>
Benzol, refined	369.4	7.0	26.2	402.6
Toluol	88.7	.5	7.9	97.1
Xylol	30.5	1.4	.1	32.0
Naphthalene	95.2	7.5	6.6	109.3
Gresols	28.8	.9	-	29.6
Phonol	61.8	.2	5.2	67.2

A relatively small proportion of the production of coke-chemicals is exported to the West, primarily to Sweden, Italy, West Germany and Norway. There is considerable intra-Bloc trade, especially among the more industrialized European Satellites.

The following use pattern for the USSR coke-chemical industry reflects the intermediate stage characteristics of these chemicals. For benzol, toluol, and phenol, the most important uses are in the chemicals industry itself. In addition, there is substantial employment of coke-chemicals, especially benzol, in the petroleum industry. The military use indicated in the table accounts not only for direct use but also indirect use through military consumption of petroleum and rubber. The military sector and armament industry are at present relatively small consumers of coke-chemicals. In a hot war situation,

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USSR USE PATTERN FOR REFINED BENZOL
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	4.4	1.7
Textiles	4.0	1.6
Electric Power	0	
Coal	0	
Petroleum	77.6	30.2
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	126.5	49.2
Rubber	15.0	5.8
Machine Tools	0	
Ball & Roller Bearings	0	
Heavy Motors & Generators	0	
Coal Mining Machinery	0	
Electron Tubes	0	
Merchant Shipbuilding	0	
Construction	0	
Mining, n.e.c.	0	
Machinery, n.e.c.	0	
Trade	0	
Consuming Industries, n.e.c.	-	
Households	-	
Defense	2.0	.8
Army		
Navy		
Air		
Inventory Accretions	16.5	6.4
Exports	11.0	4.3
TOTAL OUTPUT	257.0	100.0

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S-E-C-R-E-T

S-E-C-R-E-T

USSR USE PATTERN FOR TOLUOL
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	-	
Textiles	-	
Electric power	0	
Coal	0	
Petroleum	15.1	19.8
Steel	0	
Copper Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	28.4	37.1
Rubber	-	
Machine Tools	0	
Ball & Roller Bearings	0	
Heavy Motors & Generators	0	
Coal Mining Machinery	0	
Electron Tubes	0	
Merchant Shipbuilding	0	
Construction	0	
Mining, n.e.c.	0	
Machinery, n.e.c.	0	
Trade	0	
Consuming Industries, n.e.c.	-	
Households	-	
Defense	19.5	25.6
Army		
Navy		
Air		
Inventory Accretions	7.0	9.2
Exports	6.3	8.3
TOTAL OUTPUT	76.3	100.0

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S-E-C-R-E-T

S-E-C-R-E-T

USSR USE PATTERN FOR PHENOL
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	-	
Textiles	-	
Electric Power	0	
Coal	0	
Petroleum	2.8	5.4
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Coke-chemicals	37.6	72.7
Rubber	-	
Machine Tools	0	
Ball & Roller Bearings	0	
Heavy Motors & Generators	0	
Coal Mining Machinery	0	
Electron Tubes	0	
Merchant Shipbuilding	0	
Construction	0	
Mining, n.e.c.	0	
Machinery, n.e.c.	0	
Trade	0	
Consuming Industries, n.e.c.	-	
Households	-	
Defense	5.5	10.6
Army		
Navy		
Air		
Inventory Accretions	5.1	9.0
Exports	0.7	1.4
TOTAL OUTPUT	51.7	100.0

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR COKE-CHEMICALS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	0	
Meat 000,000 mt	0	
Fats and oils 000 mt	0	
Cotton 000 mt	0	
Wool 000 mt	0	
Hemp 000 mt	0	
Electric power 000,000,000 kwh	-	
Coal 000,000 mt	-	
Petroleum 000,000 mt	-	
Steel 000,000 mt	0	
Copper 000 mt	0	
Aluminum 000 mt	0	
Rail transport 000,000,000 ton km	-	
Motor transport 000,000,000 ton km	-	
Water transport 000,000,000 ton km	0	
Trucks 000-t ton units	0	
Tractors 000-15 hp units	0	
Locomotives units	0	
Rolling stock 000-2 axle units	0	
Refined benzol 600 mt	126.5	49.2
Toluol 000 mt	28.4	37.1
Phenol 000 mt	37.6	72.7
Rubber 000 mt	0	
Machine tools 000 units	0	
Ball and roller bearings 000,000 units	0	
Heavy motors and generators 000 kw	0	
Coal mining machinery units	0	
Electron tubes 000,000 US \$	0	
Merchant shipbuilding 000 GRT	0	
Construction %	0	
Trade %	0	
Producing industries, noc		
Households-labor 000 manyears		
Inventory depletions	0	
Imports	0	

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S-E-C-R-E-T

S-E-C-R-E-T

the use of coke-chemicals by the military sector would increase substantially and probably would surpass all other users.

Input Structure

The most important inputs into the coke-chemical industry are reflected in the large intra-industry flows. In addition, pieces of capital equipment, such as fractionating columns, which are technically necessary for production, and relatively small quantities of coal, electricity, and labor are important inputs.

Summary

The production of principal coke-chemicals in the Soviet Bloc is sufficient for their cold war needs. Only negligible amounts of these chemicals are imported and so long as explosives are not being produced at "hot war" rates, the industry can satisfy its consumers adequately.

RUBBER

Since only a negligible quantity of natural rubber is indigenous to the Soviet Bloc, synthetic rubber is substituted for natural rubber in virtually all uses. Rubber products, such as tires, footwear, clothing, mechanical goods, and various drug sundries can be fabricated from natural, synthetic, or reclaimed rubber. For durability, natural rubber, which is imported into the Bloc, in large quantities, is mixed with the synthetic.

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S-E-C-R-E-T

S-E-C-R-E-TTrends

The USSR and East Germany are the only important producers of synthetic rubber. In the USSR, the divinyl process was developed as early as 1925 and in 1932, the first large Soviet synthetic rubber plant began operation. In 1940, the so-called "Sovpren" process of synthetic rubber production was introduced. The industry has been growing rapidly and will manufacture somewhat more than 250,000 tons of synthetic rubber in 1952-1953, 80 percent of which will be produced in the USSR.

Soviet Bloc Production of Rubber Products

	<u>1938</u>	<u>1940</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>
Synthetic Rubber (000 mt)						
Bloc	-	-	121	149	185	221
USSR	-	-	90	122	143	172
East Germany	-	-	31	27	42	49
Reclaimed Rubber (000 mt)						
Bloc	-	-	-	-	63	68
USSR	-	-	30	37	45	50
China	-	-	-	-	5	5
European Satellites	-	-	2	8	13	13
Rubber Tires (000,000 units)						
USSR	-	-	5.2	6.7	8.2	9.2

S-E-C-R-E-TSupply

The following table indicates the rubber supply situation in the Soviet Bloc for 1952-1953.

Soviet Bloc Rubber Supply, 1952 - 1953
(long tons)

Type	Quantity	% of Bloc Total
Synthetic	256,000	50.6
Reclaimed	77,000	15.2
Natural (production)	3,000	.6
Natural (net imports)	170,000	33.6
Total Bloc	506,000	100.0

The imports into the Bloc are primarily natural rubber imports from Southeast Asia, mainly Malaya. There are intra-Bloc transfers of synthetic rubber. East Germany exports about half of its production (about 25,000 tons) to the USSR.

Inventory

The Soviet Bloc held a substantial stockpile of rubber which on 1 July 1952 amounted to about 280,000 tons. Of this the USSR held about 200,000 tons and China, 80,000. This rubber stockpile is being added to annually and during the period of this estimate (1952-1953) will increase by about 26,000 tons.

Pattern of Demand

Of the total availability (on current account) of 506,000 long tons of rubber in the Soviet Bloc, 480,000 tons will be consumed in 1952-1953. The remainder will be stockpiled. The accompanying table indicates the uses to which the 480,000 will be put, by country and by major product for this period.

S-E-C-B-E-T

Soviet Bloc Demand for Rubber, 1952-1953
 (Long tons)

Country	% of Total	Tons	Tires (Inc. Bicycle)		Footwear & Clothing		Mechanical Goods		Drug Sundries	
			Tons	%	Tons	%	Tons	%	Tons	%
USSR	66.4%	519,000	65.8%	210,000	17.5%	56,000	14.2%	45,000	2.5%	8,000
Bulgaria	.31	1,500	66.7	1,000	26.6	400	6.7	100	-	-
Romania	.55	2,600	69.2	1,800	25.0	650	5.4	140	*4	10
Czechoslovakia	10.9	52,000	42.4	22,000	30.7	16,000	25.	15,000	1.9	1,000
Poland	4.16	20,000	30.	6,000	25.	5,000	43.	8,600	2.	400
Hungary	2.2	10,600	35.	5,500	28.3	3,000	36.8	3,900	1.9	200
China	7.3	35,000	28.5	10,000	69.7	24,400	1.4	500	*3	100
Albania	.06	300	-	-	100.	300	-	-	-	-
East Germany	8.12	39,000	51.	20,000	27.	10,500	19.5	7,500	2.5	1,000
TOTAL	100. %	480,000	57.2%	274,300	24.2%	116,250	16.4%	78,740	2.2%	10,710

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S-E-C-B-E-T

S-E-C-R-E-T

USSR USE PATTERN FOR RUBBER
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	20	7.2
Textiles	0	
Electric Power	0	
Coal	0	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	100	36.2
Water Transport	0	
Trucks	-	
Tractors	-	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	*	
Machine Tools	0	
Ball & Roller Bearings	0	
Heavy Motors & Generators	-	
Coal Mining Machinery	6	2.2
Electron Tubes	0	
Merchant Shipbuilding	-	
Construction	-	
Mining, n.e.c.	-	
Machinery, n.e.c.	-	
Trade	-	
Consuming Industries, n.e.c.	30	10.9
Households	44	15.9
Defense	45	16.3
Army		
Navy		
Air		
Inventory Accretions	22	8.0
Exports	9	3.3
TOTAL OUTPUT	276	100.0

* Rubber allocated to end-uses in this table.

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR RUBBER

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	1.0	1.1
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	90	9.3
Wool (000 mt)	0	
Hemp (000 mt)	-	
Electric power (000,000,000 KWH)	-	
Coal (000,000 mt)	1.0	.3
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	0	
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)	-	
Motor transport (000,000,000 ton km)	-	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	-	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	15.0	5.8
Toluol (000 mt)	-	
Phenol (000 mt)	-	
Rubber (000 mt)	*	
Machine tools (000 units)	0	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (\$)	-	
Producing industries, nec		
Households-labor (000 man years)	275	.3
Inventory depletions	0	
Imports	96	

* Rubber allocated direct to end-uses.

S-E-C-R-E-T

S-E-C-R-E-T

The most important single use of rubber throughout the entire Soviet Bloc is for tires. Tires take about 57 percent of total rubber consumption; footwear takes about 24 percent, and mechanical goods about 16 percent.

Input Structure

The synthetic rubber industry and the manufacture of rubber products is a complicated set of industrial processes, requiring not only the above listed inputs, but also substantial quantities of various kinds of chemical products, such as carbide, ammonium chloride, potassium persulphate and various petroleum derivatives. Equally important are the substantial pieces of capital equipment and plant facilities needed both for the manufacture of synthetic rubber and in the making of rubber products.

Summary

The rubber and rubber products industry in the Soviet Bloc is adequate to meet the cold war needs of the economy, is capable of rapid expansion, and is on a sound technological base. The stockpile is slightly less than half a year's consumption and is growing annually.

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S-E-C-R-E-T

PART IV

G. TRANSPORTATION EQUIPMENT

The transportation equipment industry as a whole, regained its prewar peak levels of output in 1947 and 1948, and since that time has continued to expand rapidly. The industry, unlike its Western counterpart, does not produce many different types and models of substantially the same piece of transportation equipment but concentrates on a few models based upon a differentiation of function and service.

The accompanying tables indicate for the industry as a whole what progress has been made since 1938.

Soviet Bloc Production of Transportation Equipment
(units)

Year	Passenger Cars			Trucks		
	Bloc	USSR	E. Sats.	Bloc	USSR	E. Sats.
1938	40,717	26,980	13,737	186,929	183,956	2,973
1939	25,700	25,700	0	169,300	169,300	-
1940	5,236	1,000	4,236	157,500	157,500	-
1941	200	200	0	91,000	91,000	-
1942	0	0	0	41,400	41,400	-
1943	0	0	0	51,900	51,900	-
1944	244	0	244	81,521	79,400	2,121
1945	1,240	1,100	140	86,654	86,000	654
1946	5,196	1,400	3,796	120,880	118,000	2,880
1947	13,372	4,000	9,372	151,332	146,000	5,332
1948	24,598	8,400	16,198	216,395	209,000	7,395
1949	40,000	20,000	20,000	279,980	272,000	7,490
1950	58,243	29,000	29,243	362,755	353,000	9,755
1951	69,810	36,000	33,810	391,460	375,000	16,460

S-E-C-R-E-T

Soviet Bloc Production of Transportation Equipment
(units)

<u>Year</u>	<u>Bloc</u>	<u>Tractors</u>	
		<u>USSR</u>	<u>European Satellites</u>
1938	-	49,000	-
1939	-	32,500	-
1940	-	29,800	-
1941	-	10,600	-
1942	-	200	-
1943	-	1,000	-
1944	-	2,600	-
1945	7,647	7,600	47
1946	14,111	13,000	1,111
1947	33,677	27,000	6,667
1948	68,049	56,000	12,049
1949	103,670	86,000	17,670
1950	129,250	106,000	23,250
1951	143,260	116,000	27,260

<u>Year</u>	<u>Steam Locomotives</u>			<u>Electric Locomotives</u>			<u>Diesel Locomo.</u>
	<u>Bloc</u>	<u>USSR</u>	<u>E. Sats.</u>	<u>Bloc</u>	<u>USSR</u>	<u>E. Ger.</u>	<u>Bloc(USSR)</u>
1938	-	1,144	-	-	30	-	0
1940	-	917	-	-	20	-	0
1948	2,155	1,360	795	60	60	0	75
1949	2,575	1,700	875	150	110	40	140
1950	3,030	2,040	990	250	170	80	185
1951	3,295	2,170	1,125	325	225	100	205

<u>Year</u>	<u>Freight Cars</u>			<u>Railway Passenger Cars</u>
	<u>Bloc</u>	<u>USSR</u>	<u>E. Sats.</u>	(units)
1938	-	47,650	-	1,000
1940	-	50,000	-	910
1948	-	78,000	-	1,140
1949	141,350	103,000	38,350	1,750
1950	162,000	121,000	41,000	2,500
1951	186,500	131,000	55,500	2,740

S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR TRANSPORT EQUIPMENT

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	0	
Meat 000,000 mt	0	
Fats and oils 000 mt	0	
Cotton 000 mt	-	
Wool 000 mt	0	
Hemp 000 mt	0	
Electric power 000,000,000 kwh	1.3	1.0
Coal 000,000 mt	2.4	.8
Petroleum 000,000 mt	-	
Steel 000,000 mt	3.9	15.2
Copper 000 mt	13.0	4.3
Aluminum 000 mt	20	6.6
Rail transport 000,000,000 ton km	0	
Motor transport 000,000,000 ton km	0	
Water transport 000,000,000 ton km	0	
Trucks 000-2 ton units	0	
Tractors 000-15 hp units	0	
Locomotives units	50	2.9
Rolling stock 000-2 axle units	0	
Refined benzol 000 mt	0	
Toluol 000 mt	0	
lphenol 000 mt	0	
Rubber 000 mt	-	
Machine tools 000 units	13.6	14.1
Ball and roller bearings 000,000 units	37.0	34.3
Heavy motors and generators 000 kw	-	
Coal mining machinery units	0	
Electron tubes 000,000 US \$	0	
Merchant shipbuilding 000 GRT	0	
Construction %	0	
Trade %	0	
Producing industries, nec		
Households-labor 000 manycars	320	.3
Inventory depletions		
Reports		

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S-E-C-R-E-T

S-E-C-R-E-T

AUTOMOTIVE INDUSTRY

The most significant characteristic of the Soviet Bloc automotive industry is the high ratio of trucks to passenger cars. Since relatively few passenger cars are produced anywhere in the Soviet Bloc, 1952-1953 estimates for the automotive industry are based on estimated production of two ton payload trucks.

Trends

The table at the beginning of this section depicts the history of the passenger car and truck industry since 1938. During the war automotive plants either fell into the hands of the Germans or were devoted almost entirely to war production. Since the war output has increased rapidly and for the period 1952-1953, Soviet Bloc production will be 663,500 two-ton payload truck units. Of this number 623,000 or about 94 percent is manufactured in the USSR. East Germany with somewhat over 9,000 trucks is the most important satellite producer.

Supply

Soviet Bloc imports of motor vehicles from the West and exports to the West are negligible; therefore, the supply of automotive equipment is considered equal to the Bloc production. The USSR is a net exporter of motor vehicles to its Satellites but the quantities involved are not significant.

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S-E-C-R-E-T

S-E-C-R-E-TSoviet Bloc Production of Motor Vehicles
(two-ton payload truck units)

<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>E! Sats.</u>	<u>E. Ger.</u>	<u>Hung.</u>	<u>Pol.</u>	<u>Other</u>
Annual Prod. rate 1 Jul.'52	631.6	598	0	18.3	6.5	5.0	3.8 0
Annual Prod. rate 1 Jul.'53	694.5	647	0	23.3	11.7	5.0	7.5 0
Average Prod. rate	663.5	623	0	20.8	9.1	5.0	5.6 0

Inventory

In the USSR there is a motor vehicular park of about one and one-half million trucks and buses and two hundred thousand automobiles. The park in the United States is 36,000,000 automobiles, 7.7 million trucks (less than one third of the trucks are in the military park) and about 150,000 buses.

Pattern of Demand

About one-half of the motor vehicular output of the USSR goes to the motor transportation industry. About 10 percent goes into agriculture, and the remainder is allocated among many uses throughout the economy. It is not possible to break down the allocation of trucks on the basis of civilian and military usage. It is not certain that such a breakdown is meaningful, since all trucks are potentially military trucks.

S-E-C-R-E-T

USSR USE PATTERN FOR TRUCKS
(000 2-ton units)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	60	9.6
Textiles	0	
Electric power	0	
Coal	0	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	305	49.0
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	-	
Machine Tools	-	
Ball & Roller Bearings	0	
Heavy Motors & Generators	-	
Coal Mining Machinery	0	
Electron Tubes	0	
Mechant Shipbuilding	-	
Construction	-	
Mining, n.e.c.		
Machinery, n.e.c.		
Trade		
Consuming Industries, n.e.c.	258	41.4
Households		
Defense		
Army		
Navy		
Air		
Inventory Accretions	0	
Exports	0	
TOTAL OUTPUT	623	100.0

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S-E-C-R-E-T

S-E-C-R-E-TUSSR Truck Use Pattern 1952-1953
(000 2-ton payload units)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percent</u>
Agriculture	60.0	9.6
Motor Transport	305.0	49.0
Consuming Industries, nec	258.0	44.4
TOTAL	623.0	100.0

Input Structure

The automotive industry is a substantial consumer of ball and roller bearings and various other types of production machinery.

Summary

The automotive industry of the Soviet Bloc concentrating on the production of traffic-hauling equipment, is adequate to meet the cold war demands of the economy. While the park is small by Western standards and current production is relatively low, the industry is expanding rapidly and is sufficient for Soviet Bloc needs.

S-E-C-R-E-T

USSR INPUT PATTERN FOR TRUCKS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	-	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KW)	0.8	.6
Coal (000,000 mt)	1.3	.4
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	1.2	4.8
Copper (000 mt)	2.0	.7
Aluminum (000 mt)	10	3.3
Rail transport (000,000,000 ton km)	0	
Motor transport (000,000,000 ton km)	0	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	-	
Machine tools (000 units)	4.9	5.1
Ball and roller bearings (000,000 units)	29.0	26.9
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	0	
Producing industries, nec		
Households-labor (000 man years)	165	.2
Inventory depletions	0	
Imports	0	

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S-E-C-R-E-T

S-E-C-R-E-T

TRACTOR INDUSTRY

The Soviet Bloc is a major producer of tractors, the USSR, the second largest producer, produces about 20 percent of the United States output in number, with a higher proportion of the heavier duty track-laying tractors.

Trends

Tractor production has had an uneven history in the Soviet Bloc. The peak prewar production in 1935 was reduced sharply in the late thirties and in the war was reduced practically to zero. Since the war production has increased substantially. The Fifth Five Year Plan indicates relatively modest increases in tractor production and a levelling off of production between 1950 and 1955.

Supply

Tractor production is stated in 15 horsepower wheeled units. The USSR is by far the greatest producer of tractors with not quite 85 percent of total Soviet Bloc production. The next largest producer is Czechoslovakia.

Table I

Soviet Bloc Output of Tractors in 15 hp. Wheeled Units
(units)

<u>Bloc</u>	<u>USSR</u>	<u>China</u>
Production 1 July 1952	443,550	375,000
Production 1 July 1953	473,550	397,500
Average Prod.	459,300	387,000

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S-E-C-R-E-T

S-E-C-R-E-T

Table II

Soviet Bloc Output of Tractors in 15 hp. Wheeled Units
(units)

	<u>Eur.</u>	<u>Sats.</u>	<u>Alb.</u>	<u>Bulg.</u>	<u>Czecho.</u>	<u>E. Ger.</u>	<u>Hung.</u>	<u>Pol.</u>	<u>Rum.</u>
Production 1 July 1952		68,550	0	0	26,700	13,750	12,500	10,000	5,600
Production 1 July 1953		76,050	0	0	26,700	16,250	12,500	15,000	5,600
Average Production		72,300			26,700	15,000	12,500	12,500	5,600

Only negligible numbers of tractors enter into East-West trade, while intra-Bloc trade consists principally of exports from the USSR and Czechoslovakia to other Bloc countries.

Inventory

The park of tractors in the Soviet Bloc is not quite double that of annual production. The Soviet Bloc has a park of about 450,000 15 horsepower unit wheel tractors. The European Satellites have a park of about 200,000 units.

Pattern of Demand

Tractors are used primarily in agriculture, construction, some industrial activities, and by the military establishment. Wheel tractors are used principally for work in orchards and in plantations, while track-laying tractors are concentrated in the agricultural sector in machine tractor stations, in construction work, and by the military establishment.

S-E-C-R-E-T

USSR INPUT PATTERN FOR TRACTORS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	0.3	.2
Coal (000,000 mt)	0.8	.3
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	0.7	2.3 2.8
Copper (000 mt)	4.0	1.3
Aluminum (000 mt)	2	.7
Rail transport (000,000,000 ton km)	0	
Motor transport (00,000,000 ton km)	0	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	-	
Machine tools (000 units)	2.9	3.0
Ball and roller bearings (000,000 units)	4.0	3.8
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	0	
Producing industries, nec		
Households-labor (000 man years)	90	.1
Inventory depletions	0	
Imports	427	

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S-E-C-R-E-T

S-E-C-R-E-TUSSR Tractor Use Pattern
(000 15 horsepower units)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	247	65
Construction	40	10
Consuming industries, n.o.c.	40	10
Military	60	15
TOTAL	387	100

Input Structure

The tractor industry is not a large consumer of any of the basic resources of the economy. Steel and other metals are used but not in very large quantities. In addition, ball and roller bearings in substantial quantities, facilities of machine tools, and other metal working equipment are important inputs into the industry.

Inputs into USSR Tractor Industry 1952-1953Producing Industry

Electric Power (000,000 kwh)	0.3
Coal (000,000 mt)	0.8
Steel (000,000 mt)	0.7
Machine Tools (000 units)	2.9
Ball and Roller Bearings (000,000 units)	4.0
Producing Industries, n.e.c. (%)	10.0
Labor (000 man years)	90.0
Batteries (000 units)	125.0

Summary

The tractor industry of the Soviet Bloc is producing at a level adequate to the demand placed upon it under cold war conditions.

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USSR USE PATTERN FOR TRACTORS
(000 15-hp units)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	290	74.9
Textiles	0	
Electric Power	0	
Coal	0	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	0	
Machine Tools	0	
Ball & Roller Bearings	0	
Heavy Motors & Generators	0	
Electron Tubes	0	
Merchant Shipbuilding	-	
Construction	29	7.5
Mining, n.e.c.	-	
Machinery, n.e.c.	-	
Trade	-	
Consuming Industries, n.e.c.	29	7.5
Households	-	
Defense	39	10.1
Army	-	
Navy	-	
Air	-	
Inventory Accretions	0	
Exports	0	
TOTAL OUTPUT	387	100.0

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LOCOMOTIVES

Because of the relative backwardness of the Russian transportation system at the time of the Revolution in 1917, construction of locomotives and rolling stock has been of critical importance to Soviet industrial development.

Trends

In the inter-war period, the USSR was probably the world's leading producer of locomotives. However, the physical plant of the railroads as well as the factories devoted to locomotive production suffered heavy damage in the war. Restitution, at the end of the war, of locomotives taken by the Germans, left the Soviet locomotive park smaller than it was in 1940. The USSR remedied this deficiency by giving locomotives a relatively high priority in the Fourth Five Year Plan and by stimulating locomotive production in the European Satellites. The post war emphasis has been upon steam locomotives primarily for freight haulage. Basic design has barely changed since the Czarist times.

Since 1950, the production rate in the USSR has declined somewhat, presumably because (a) of the diversion of facilities to the production of military equipment, and (b) the policy of expanding locomotive production in the European Satellites to replace USSR production.

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Supply

Soviet Bloc production for the period 1952-1953, will be slightly more than 2,900 locomotive units. Of this total, about 69 percent will be manufactured in the USSR. Czechoslovakia and Poland are important European Satellite producers of locomotives.

The Soviet Bloc does not export to the West, locomotives, while it imports only about 50 locomotives per year. The principal intra-Bloc movement is export from the European Satellites to the USSR and China.

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~~S-E-C-R-E-T~~Soviet Bloc Current Locomotive Supply

<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>Eur.</u>	<u>Sats.</u>	<u>Alb.</u>	<u>Bulg.</u>	<u>Czech.</u>	<u>E. Ger.</u>	<u>Hung.</u>	<u>Pol.</u>	<u>Ruman.</u>
Annual Rate											
1 Jul. 1952	3,060	1,900	65	1,095						215	310
1 Jul. 1955	2,790	1,600	65	1,125						225	320
Average Production	2,925	1,750	65	1,110						220	315
Exports	0	0	0	482	0	0	87	0	156	144	114
Imports	50	427	105	0	5	14	0	0	0	0	0
Net Trade											
Balance											
Trade balance plus domestic production	2,975	2,177	170	628	5	14	-87	0	-156	-144	-114

~~-S-E-C-R-E-T-~~~~S-E-C-R-E-T~~

S-E-C-R-E-TInventory

Locomotives in the Soviet Bloc have a relatively long life. Virtually, none of the locomotives placed in service since the Revolution have been retired as obsolete. The strategic inventory of locomotives is as follows:

Locomotive Park

	<u>1952</u>	<u>1953</u>
USSR	36,000	37,500
Poland	6,050	6,100
East Germany	5,500	5,500
Czechoslovakia	4,400	4,600
Hungary	1,700	1,730
Rumania	3,050	3,075
Bulgaria	720	720
Albania	Negligible	
China	4,698	4,764
European Satellites	21,420	21,725
Bloc	62,118	63,989

Pattern of Demand

The demand for locomotives comes primarily from the rail transport industry. It cannot be said that the demand is fully satisfied, since the transport system in the Soviet Bloc, especially the USSR, has long been neglected. However, there is no indication that a shortage of locomotives will seriously impair the operation of the transport network.

USSR Locomotive Use Pattern

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percent</u>
Rail Transport	1,700	97
Locomotives	50	3
Total	1,750	100

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Input Pattern

The input table lists the most important inputs into the locomotive industry in the USSR. Omitted are perhaps the most strategic items since capital equipment, such as cranes, presses, forges, and other metal working equipment, important to the locomotive production, are not listed.

Summary

Soviet Bloc production of locomotives plus their park, is adequate to meet the needs of the Soviet rail transport industry. Locomotives and other pieces of railroad equipment, while overworked, their service life is relatively long. Concentration upon relatively few models enables the industry to operate at an efficient scale of output.

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USSR INPUT PATTERN FOR LOCOMOTIVES

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	0.1	.1
Coal (000,000 mt)	0.1	-
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	0.6	2.4
Copper (000 mt)	4.0	1.3
Aluminum (000 mt)	4	1.3
Rail transport (000,000,000 ton km)	0	
Motor transport (000,000,000 ton km)	0	
Water transport (000,000,000 ton km)	0	
Trucks (000 ~ 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	50	2.9
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	2.4	2.5
Ball and roller bearings (000,000 units)	2.0	1.8
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	0	
Producing industries, nec		
Households-labor (000 man years)	25	
Inventory depletions	0	
Imports	26.4	

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ROLLING STOCK

The Soviet Bloc produces a limited number of types of rolling stock. The most important types are the sixty-ton flat cars, the fifty-ton box and tank cars, the forty-ton hoppers, and the forty to sixty-ton tipping gondolas. These cars, for the most part are eight wheeled, but a few four wheel cars are still being constructed. Passenger cars in a limited number of models are also being constructed.

Trends

Soviet Bloc Production of Freight Cars
(units)

<u>Year</u>	<u>All Freight Cars</u>
1937	34,000
1938	33,000
1939	32,000
1940	31,000
1941	30,000
1946	16,000
1947	25,000
1948	36,000
1949	53,000
1951	62,000

The above figures are the actual number of units produced. On the basis of uniform two-axle units, the Soviet Bloc will produce in 1952-1953, slightly more than 200,000 two-axle units. Of these, 75 percent will be produced in the USSR. Hungary and East Germany are the major satellite producers.

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S-E-C-R-E-TSupply

The following table shows the supply situation in the Soviet Bloc for 1952-1953.

Soviet Bloc Supply of Railroad Rolling Stock
(000 units)

	<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>Eur. Sats.</u>	<u>Alb.</u>	<u>Bul.</u>	<u>Czech.</u>	<u>E. G.</u>	<u>Hung.</u>
Prod. Rate (1 July 52)	201.6	152	2.5	47.1	0	1.3	8	5.5	8.5
Prod. Rate (1 July 53)	203.6	152	2.5	49.1	0	1.3	8	5.5	9.5
Production	202.6	152	2.5	48.1	0	1.3	8	5.5	9.0
Exports	0	0	0	26.4	0	0	5.3	2.1	7.8
Imports	0	26.4	0	0	0	0	0	0	0
Trade Bal.	0	26.4	0	-26.4	0	0	-5.3	-2.1	-7.8
Total Domestic Supply	202.6	178.4	2.5	21.7	0	1.3	2.7	3.4	1.2

Inventory

As in the case of locomotives, the rolling stock in the Soviet Bloc has a very long life. The following table indicates the strategic inventory of rolling stock in 1952 and 1953.

Soviet Bloc Strategic Inventory of Rolling Stock in 1952 and 1953
(units)

	<u>1 July 1952</u>	<u>1 July 1953</u>
USSR	1,396,360	1,545,633
Poland	181,000	188,520
East Germany	121,730	122,660
Czechoslovakia	100,500	101,700
Hungary	41,790	42,294
Rumania	66,800	68,000
Bulgaria	15,550	15,500
Albania	191	191
China	82,400	83,400
All European Satellites	527,561	538,915
All Soviet Bloc	2,006,321	2,167,948

S-E-C-R-E-TPattern of Demand

Rolling stock is allocated in its entirety to the railroad transportation industry. As in the case of locomotives, the park constitutes an important ingredient in rolling stock usage. By Western standards, current production is low and the park small, however, they appear adequate to meet the needs of the cold war economy.

Input Structure

The rolling stock industry in the Soviet Bloc is a relatively small industry which does not consume large quantities of any of the basic resources of the economy.

Inputs into USSR Rolling Stock Industry 1952 - 1953Producing Industry

Electric Power (000,000,000 kwh)	0.1
Coal (000,000 mt)	0.2
Steel (000,000 mt)	1.3
Ball and Roller Bearings (000,000 units)	2.0
Producing Industries, n.e.c. (%)	20.0
Labor (000 man years)	40.0

Summary

The Soviet Bloc concentrates upon a relatively small number of models. The obsolescence and depreciation rates in the industry are relatively low. Current production and the park are adequate to meet the cold war demand on the economy.

S-E-C-R-E-T

USSR INPUT PATTERN FOR ROLLING STOCK

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and Oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	0.1	.1
Coal (000,000 mt)	0.2	.1
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	1.3	5.2
Copper (000 mt)	2.0	.7
Aluminum (000 mt)	4	1.3
Rail transport (000,000,000 ton km)	0	
Motor transport (000,000,000 ton km)	0	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 15 hp units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	1.5	1.5
Ball and roller bearings (000,000 units)	2.0	1.8
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	0	
Producing industries, nec		
Households-labor (000 man years)	40	-
Inventory depletions	0	
Imports	0	

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MERCHANT SHIPBUILDING

This report covers merchant shipbuilding only. In the USSR, this is only a small percentage of all shipbuilding, while in the European Satellites, merchant shipbuilding is more important than naval construction.

Trends

Merchant shipbuilding is a very erratic industry over time and in the Soviet Bloc, it has been conspicuously so. The current expansion in the industry began in 1948.

Supply

The accompanying table indicates the supply position of the entire Soviet Bloc insofar as merchant shipbuilding is concerned. It is to be noted that the USSR is not a significant contributor to the Soviet Bloc; the USSR produces only about 18 percent of the total. East Germany is the largest single producer, the USSR is next, and Poland next.

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S-E-C-R-E-TUSSR Pattern of Shipbuilding (Merchant) in the Soviet Bloc

<u>Industry</u>	<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>Eur.</u>	<u>Sats.</u>	<u>Alb.</u>	<u>Bulg.</u>	<u>Czecho.</u>	<u>East Ger.</u>	<u>Hung.</u>	<u>Pol.</u>	<u>Russia</u>
Production	446,382	81,000	48,000	317,382	1,800	7,582	15,000	155,000	40,000	72,000	36,000	-152-
Exports (negative)	0	0	0	-168,300	0	-2,000	-4,000	-92,000	-18,300	-22,000	-30,000	
Imports (positive)		132,000	1168,000	0	± 32,000							
Net Trade Balance		132,000	1200,300	0	-168,300	0	-2,000	-4,000	-92,000	-18,300	-22,000	-30,000
Total Domestic Supply	478,382	281,300	48,000	149,082	1,800	5,582	11,000	53,000	21,700	50,000	6,000	

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S-E-C-R-E-TInventory

Little is known of the inventory, that is, the Merchant Fleet of the European Satellites. The following table is the USSR Merchant Fleet for 1952-1953.

USSR Merchant Fleet

	<u>1952</u>	<u>1953</u>
Maritime	3,678,000 GRT	not available
River Fleet		
Self-propelled	278,000	295,000
Non self-propelled	4,010,000	4,250,000
Total River Fleet	<u>4,288,000</u>	<u>4,545,000</u>
Caspian Fleet		
Cargo, passenger & combine (over 1,000tons)	44,000	46,000
Tankers (over 1,000 tons)	303,000	310,000
Self-propelled (under 1,000 tons)	12,000	12,000
Non self-propelled	44,000	46,000
Total	<u>403,000</u>	<u>414,000</u>
Fishing Fleet	<u>371,000</u>	<u>390,000</u>
Grand Total	<u>8,740,000</u>	

Satellite Merchant Fleets - 1951

	<u>Combination</u>	<u>Freights</u>	<u>Tankers</u>	<u>Misc.</u>	<u>Total</u>
Poland	19,634	186,933	14,694	9,302	230,563
China	53,058	86,627	16,278	-	155,963
Bulgaria	-	10,338	-	-	10,338
Hungary	-	1,022	-	-	1,022
Rumania	12,367	14,491	-	-	26,858
Czechoslovakia	-	-	-	-	-
East Germany	-	-	-	-	-
Albania	-	-	-	-	-
TOTAL	85,059	299,411	30,972	9,302	424,744

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Care should be taken in comparing the Satellite and USSR data because of the difference in time period and the apparent greater inclusiveness of the USSR data. The Satellite estimates ignore various small craft included in the USSR estimates.

Pattern of Demand

Merchant shipbuilding is allocated in its entirety to water transportation.

Inputs

While merchant shipbuilding can be in a time of high levels of activity a large consumer of many of the base materials, during 1952-1953 it is a relatively small industry, especially in the USSR.

Inputs into USSR Shipbuilding Industry 1952-1953Producing Industry

Steel (000,000 metric tons)	0.1
Copper (000 metric tons)	1.0
Machine Tools (000 units)	1.9
Producing Industries, n.e.c. (%)	40.0
Labor (000 man.years)	40.0
Coal (000 metric tons)	20.0
Cement (000 metric tons)	300.0

Summary

Current production and the merchant fleet is adequate to meet the cold war needs of the Soviet Bloc economy.

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USSR INPUT PATTERN FOR MERCHANT SHIPBUILDING

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	-	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	-	
Coal (000,000 mt)	0	
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	0.1	.4
Copper (000 mt)	1.0	.3
Aluminum (000 mt)		
Rail transport (000,000,000 ton km)	-	
Motor transport (000,000,000 ton km)	-	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	-	
Tractors (000 - 15 hp units)	-	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	-	
Machine tools (000 units)	1.9	2.0
Ball and roller bearings (000,000 units)		
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	0	
Producing industries, nec		
Households-labor (000 man years)	40	
Inventory depletions	0	
Imports	200	

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PART IV

H. MACHINERY

The machinery sector, as a whole, includes machine tools, heavy motors and generators, ball and roller bearings, coal mining machinery, electron tubes, and machinery, n.e.c. Electron tubes do not properly fall under the definition of machinery, but have been included because of the absence of a more closely related classification.

Agricultural, textile and construction machinery are three important sectors which are not specifically identified in the transactions table. They are a significant part of the machinery, n.e.c. category.

The significance of the machinery, n.e.c. sector is evident from its input structure. The steel input, for example, is almost 10 times the total input for the machinery items specifically shown in the table,

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USSR INPUT PATTERN FOR MACHINERY

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	0	
Meat 000,000 mt	0	
Fats and oils 000 mt	0	
Cotton 000 mt	-	
Wool 000 mt	0	
Hemp 000 mt	0	
Electric power 000,000,000 kwh	0.4	8.5
Coal 000,000 mt	0.1	
Petroleum 000,000 mt	0.6	1.4
Steel 000,000 mt	5.3	21.2
Copper 000 mt	34.7	11.6
Aluminum 000 mt	31.	10.0
Rail transport 000,000,000 ton km	-	
Motor transport 000,000,000 ton km	2.2	7.0
Water transport 000,000,000 ton km	0	
Trucks 000-2 ton units	-	
Tractors 000-15 hp units	0	
Locomotives units	0	
Rolling stock 000-2 axle units	0	
Refined benzol 000 mt	0	
Toluol 000 mt	0	
Phenol 000 mt	0	
Rubber 000 mt	6	2.2
Machine tools 000 units	38.8	39.9
Ball and roller bearings 000,000 units	38.2	35.3
Heavy motors and generators 000 kw	-	
Coal mining machinery Units	0	
Electron tubes 000,000 US \$	-	
Merchant shipbuilding 000 GRT	0	
Construction %	8.3	8.3
Trade %	9.0	9.0
Producing industries, nec		
Households-labor 000 manyears	231	2.7
Inventory depletions		
Imports		

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THE MACHINE TOOL INDUSTRY IN THE SOVIET BLOC

The machine tool industry is defined as an industry producing power driven non-portable machines which remove metal in the form of chips. In this category would be such items as boring, broaching, drilling, gear-cutting, grinding, milling, and planning machines; lathes, shapers, and slotters; honing and lapping, polishing and buffing, tapping, threading, and rifling machines.

Trends

The machine tool industry in the USSR is a relatively young industry. Total production was only 18.1 thousand units in 1932, rising to 55.0 thousand units by 1939. Production fell to 10,000 units during the war(1942) due to the invasion and loss of European Russia, where the greater part of the machine tool industry was concentrated. By the end of 1948, production had risen again to the highest pre-war year rate, and had increased to an estimated 74.7-81.1 thousand units by 1951. Machine tool production from 1 July 1952 to 1 July 1953 is estimated at about 95 thousand units.

Supply

Machine tool production for the Soviet Bloc is expected to be roughly 170,000 units between 1 July 1952 and 1 July 1953; 60 percent of which will be produced within the USSR. Czechoslovakia and East Germany are each expected to produce

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15 percent of the Bloc total. The composition of Soviet Bloc supply is shown below.

Soviet Bloc Supply of Machine Tools, 1 July 1952 to 1 July 1953
(units)

<u>Producing Country</u>	<u>Units</u>	<u>Percent of Total</u>
USSR	97,083	56.1
Czechoslovakia	27,417	15.8
East Germany	24,333	14.1
Other Satellites	16,164	9.3
China	3,000	1.7
Non Bloc (imports)	5,000	2.9
TOTAL	172,997	99.9

The present machine tool supply position of the USSR is satisfactory. Machine tools are long lived pieces of capital equipment; hence, the inventory or park of tools is vastly more important than the current rate of production.

The USSR machine tool park was about 1,150,000 in 1951, comparable in size to the US and the German park at the beginning of the last war. Estimates of USSR, US, and German machine tool inventory for selected years are shown below.

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Inventory of Machine Tools in the USSR, Germany and the US
for Selected Years
 (thousands of units)

<u>Year (as of 1 Jan.)</u>	<u>USSR</u>	<u>Germany</u>	<u>US</u>
1933	194.4		
1938	369.1		
1940		1,178	942
1941	525.7	1,306	1,053
1942		1,438	1,247
1943		1,555	1,529
1944		1,657	1,771
1945		1,737	1,883
1946			
1947			
1948	923.3		
1949	990.6		
1950	1,067.0		
1951	1,148.7		

The present size of the USSR inventory is attributable to factors other than the domestic production rate. The US shipped about 55,000 machine tools to the USSR under lend lease aid during the last war. In addition, the USSR acquired some 270,000 tools from Germany, Austria, and Manchuria after the war.

Comparison of annual production trends in these three countries with the size of inventory clearly indicates the relative importance of current production in the over-all supply picture.

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Annual Production of Machine Tools in the US, Germany,
and the USSR for Selected Years
(thousands of units)

<u>Year</u>	<u>US</u>	<u>Germany</u>	<u>USSR</u>
1932			18.1
1936			32.4
1940	100.0	199.5	45.3 - 49.3
1942	307.0	165.9	10.0
1944	136.0	110.4	21.0
1946	67.0		33.7 - 36.7
1948	44.3		54.4 - 59.2
1950			72.5 - 78.9
1951			74.7 - 81.4

Ratio of Annual Production to Inventory in the Machine Tool
Industry for the US, Germany, and the USSR for Selected Years

<u>Year</u>	<u>US</u>	<u>Germany</u>	<u>USSR</u>
1932			10.0
1936			10.9
1940	10.6%	16.9%	10.0
1942	24.7%	11.6%	
1944	7.7%	6.7%	
1946	3.5%		
1948			6.3
1950			6.9
1951			6.8

Appraisal of the supply of machine tools must lean not only on the extent of the machine tools inventory, but also on the composition, by type and age distribution. The distribution of the USSR machine tools inventory by type is not known at present, but a rough approximation to it can be deduced from the following table. This table shows the distribution by type of annual output in the USSR for several

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pre-war years, and the distribution by type of the US inventory for pre-war and post-war years. A comparison of the USSR and US data reveals that a rough order of magnitude is quite similar.

Percentage Distribution of Annual USSR Machine Tool Production by Type for 1932, 1937, and 1941, Compared to Percentage Distribution of US Machine Tool Inventory by Type for 1940, 1945, and 1949

<u>Type of Tool</u>	<u>USSR Annual Production</u>			<u>US Inventory</u>		
	<u>1932</u>	<u>1937</u>	<u>1941</u>	<u>1940</u>	<u>1945</u>	<u>1949</u>
Boring Mach.	0.3	0.5	0.8	2.9	2.9	3.2
Broaching Mach.				0.5	0.6	0.7
Cutoff Mach.				4.6	4.4	4.5
Drilling Mach.	37.7	16.2	19.1	20.9	19.8	20.5
Gear Cutting Mach.		1.4	1.2	2.2	3.2	2.8
Grinding &						
Polishing Mach.	2.6	6.7	6.0	21.7	24.8	25.5
Honing and Lapping lathes	42.1	33.3	29.5	25.2	24.5	22.5
Milling Mach.	5.9	8.8	8.9	10.1	10.0	10.3
Planers & Shapers	4.8	4.1	2.8	4.5	3.1	3.3
Special Purpose	0.2	n.a.	14.8			
Automatic & Semi		0.2	5.4			
Misc.	6.3	28.9	11.4	7.7	5.5	5.2

Despite some differences in the use classification for the USSR and the US, it is significant that the structures of the machine tool industry in the two countries are becoming more similar. The chief difference occurs in the grinding and polishing machines category, due partly to differences in classification and partly to dissimilar tool finishing practices. Of significance in the USSR also is the growing importance of automatic special purpose machine tools which are capable

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of increased production, but capable of performing only for the task for which it was designed.

A note of caution should be injected here as regards the evaluation of production or inventory estimates in units of machine tools. If, as seems likely, the average machine tool produced in 1950 is more complicated and more efficient than the average tool produced in 1940, than a production series in units will underestimate the true value of machine tool production in 1950 relative to 1940. This is basically a weighting problem, and has not been solved yet.

Pattern of Demand

The distribution of machine tool output in the Soviet Bloc is not known accurately. The following use pattern table presents the best guesses of the distribution of machine tools in the USSR.

It must be born in mind that the allocation of current machine tool production among industries is not a complete measure of the use of the facilities of the machine tool industry. The allocation from current production may vary substantially from year to year. The only steady demands upon the machine tools industry are those demands which arise out of the necessity for replacing the machine tools already in the industry.

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USSR USE PATTERN FOR MACHINE TOOLS
(000 mt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	-	
Textiles	-	
Electric Power	0	
Coal	0	
Petroleum	-	
Steel	-	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	4.9	5.1
Tractors	2.9	3.0
Locomotives	2.4	2.5
Rolling Stock	1.5	1.5
Coke & Chemicals	0	
Rubber	0	
Machine Tools	9.7	10.0
Ball & Roller Bearings	0.5	.5
Heavy Motors & Generators	2.0	2.1
Coal Mining Machinery	.4	.4
Electron Tubes	.1	.1
Merchant Shipbuilding	1.9	2.0
Construction	1.0	1.0
Mining, n.e.c.	0	
Machinery, n.e.c.	26.1	26.8
Trade	0	
Consuming Industries, n.e.c.	23.3	24.0
Households	0	
Defense	18.4	19.0
Army	6.8	7.0
Navy	2.9	3.0
Air	8.7	9.0
Inventory Accretions	1.9	2.0
Exports	0	
TOTAL OUTPUT	97.0	100.0

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The uses of machine tools are so broad and varied that any short fall in supply would have some repercuSSION in nearly every sector of the economy producing industrial products. In the Soviet Bloc the shortage would probably not be allowed to effect the essential category unless the cutback was very severe. While by far the greatest demand for machine tools is in the machinery industries, military end use demand constitutes 19 percent of total. It should be kept in mind that the machine tool industry is a relatively small industry and that while present facilities are operating close to capacity, the industry is growing, and the facilities of other machine building plants are capable of conversion to machine tool production. In addition, since current production is less important in its uses than is the machine tool inventory, the problem is not alone one of allocating production among its uses but rather one of making most effective utilization of the total machine tool facilities of the economy.

Input Structure

The machine tool industry is not a large consumer of any of the basic resources of the economy. Highly skilled labor is a requirement of the industry as well as relatively small amounts of the important metals, electric power, electrical equipment, and transportation. The inputs into this industry are not in critical short supply and there is no indication

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USSR INPUT PATTERN FOR MACHINE TOOLS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000,mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	0.2	.2
Coal (000,000 mt)	0	
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	0.2	.8
Copper (000 mt)	0.8	.3
Aluminum (000 mt)	1	.3
Rail transport (000,000,000 ton km)	-	
Motor transport (000,000,000 ton km)	-	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	-	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	9.7	10.0
Ball and roller bearings (000,000 units)	2.5	2.3
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	0	
Producing industries, nec		
Households-labor (000 man years)	100	.1
Inventory depletions	0	
Imports	-	

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that the operation of the industry will be impaired by the shortage of inputs.

Summary

Current production of machine tools in the Soviet Bloc is sufficient under cold war conditions. The machine tool inventory is roughly comparable to the US and German position at the start of the last war. The industry while operating at full capacity can be expanded in a relatively short period of time by making use of other machine building plants and through growth of the industry itself. Under cold war conditions there is no reason why the demands of all of the important machine tool users cannot be fully satisfied.

HEAVY MOTORS AND GENERATORS

This report covers induction, synchronous, and direct current motors and hydrogen-cooled, air-cooled, and water-wheel driven generators greater than 500 kilowatt rated capacity.

Trends

The heavy motors and generators industry of the Soviet Bloc has received heavy emphasis from the Second Five Year Plan up to the present. Since the development of electric power capacity is essential to a modern economy, from early in the 1930's up to the present, the Soviet Bloc has imported a substantial part of their heavy motors and generators and have expanded the industry as rapidly as they could. The proportion

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of imports to domestic supply has decreased over the period, and by 1952 was 25 percent of total supply. Production of very large generators has been receiving somewhat greater emphasis over the past five years.

The production of heavy motors and generators declined rapidly during World War II both because of the conversion of plants and to the overrunning of European Russia. This production decline did not hamper the USSR war effort to any considerable extent because of the transference of machinery to the East and the resulting increase in installed capacity in that area. The satellite countries have been historically important sources of supply of heavy electrical equipment to the USSR, particularly East Germany, Czechoslovakia, and Hungary.

Supply

The Soviet Union has an installed generator capacity of approximately twenty-two million kilowatts. Installed motor capacity runs from 45 to 50 million kilowatts capacity. Current production of heavy motors and generators is between 10 and 15 percent of installed capacity. The following table indicates production of heavy motors and generators in the Soviet Bloc between 1 July 1952 and 1 July 1953,

S-E-C-R-E-TProduction of Heavy Motors and Generators in the Soviet Bloc,
1 July 1952 to 1 July 1953

<u>Producing Country</u>	<u>Amount (kw rated capacity)</u>	<u>Percent of Total</u>
USSR	3,539,200	57.6
Czechoslovakia	898,880	14.7
East Germany	1,011,240	16.5
Hungary	505,620	8.3
Other Satellites	<u>179,776</u>	<u>2.9</u>
TOTAL	6,124,716	100.0

While indigenous Soviet Bloc production of this equipment is augmented substantially by imports from the West, Czechoslovakia and East Germany, both produce substantial quantities. The Soviet Union produces over half of all heavy motors and generators in the Bloc. The following table illustrates the importance of imported heavy electrical equipment to the Soviet Bloc.

Supply of Heavy Motors and Generators in the Soviet Bloc,
1 July 1952 to 1 July 1953
(kw rated capacity)

<u>Country</u>	<u>Production</u>	<u>Net Imports</u>	<u>Total Supply</u>	<u>Percent of Total</u>
USSR	3,539,200	1,385,825	4,925,025	59.4
Czechoslovakia	898,880	3,275	902,155	10.9
East Germany	1,011,240	- 109,250	901,990	10.9
Hungary	505,620	64,150	569,770	6.9
Other Satellites	<u>179,776</u>	<u>808,760</u>	<u>988,536</u>	<u>11.9</u>
TOTAL	6,134,716	2,152,760	8,287,476	100.0
Percent of Total	74	26	100	

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The column in the total labelled Net Imports is somewhat misleading, since each of the countries import from both the West and from other areas in the Soviet Bloc. The distribution of this trade in heavy motors and generators is shown in the following table:

Trade in Heavy Motors and Generators by the Soviet Bloc,
1 July 1952 to 1 July 1953
 (kw rated capacity)

<u>Country</u>	<u>Net imports from West</u>	<u>Net imports from Bloc</u>	<u>Total net Imports</u>
USSR	+1,274,225	+111,600	+1,385,825
Czechoslovakia	+ 154,875	-151,600	+ 3,275
East Germany	+ 165,750	-275,000	- 109,250
Hungary	+ 165,750	-101,600	+ 64,150
Other Satellites	+ 392,160	+416,600	+ 808,760

All data so far has been given in terms of kilowatt rated capacity. This unit is useful for measuring aggregates of the total production or supply of all kinds and sizes of heavy motors and generators. However, the general composition of this aggregate should also be noted. The following table shows the distribution by type of unit produced in the average size in kilowatt capacity of each type of motor and generator produced in the Soviet Bloc.

S-E-C-R-E-TDistribution by Type of Unit of Heavy Motors and Generators
in the Soviet Bloc, 1 July 1952 to 1 July 1953

<u>Motors</u>			
<u>Type</u>	<u>Number of Units</u>	<u>Total kw Capacity</u>	<u>Average kw Capacity</u>
Induction	381	833,160	2,186
Synchronous	404	889,075	2,200
Direct Current	288	1,054,700	3,662
TOTAL	1,073	2,934,400	—

<u>Generators</u>			
Hydrogen-cooled	18	747,300	41,517
Air-cooled	495	1,627,100	3,287
Water-wheel driven	207	649,250	3,136
TOTAL	720	3,192,000	—

Inventory

The total capacity of the USSR is rated at 22 million kilowatts, in terms of installed generator capacity. Motor capacity is between 45 and 50 million kilowatts capacity. There is no indication that motors or generators are stockpiled in the sense that they are produced and set aside in storage to be held for later use. The total rated capacity is a measure of the park of heavy electrical equipment.

Pattern of Demand

Heavy motors and generators are used primarily in the heavy industrial complexes of the Soviet Bloc. A significant proportion of this electrical equipment is used directly in the production of military end items, particularly in the

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USSR USE PATTERN FOR HEAVY MOTORS AND GENERATORS
(000 kwt)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	---	
Textiles	---	
Electric power	1400	39.4
Coal	---	
Petroleum	300	8.6
Steel	400	11.3
Copper	---	
Aluminum	---	
Rail transport	200	5.6
Motor transport	0	
Water transport	0	
Trucks	---	
Tractors	---	
Locomotives	---	
Rolling stock	---	
Coke-chemicals	0	
Rubber	---	
Machine tools	---	
Ball and roller bearings	---	
Heavy motors & generators	---	
Coal mining machinery	---	
Electron tubes	0	
Merchant shipbuilding	---	
Construction	---	
Mining, nec	120	3.4
Machinery, nec	0	
Trade	0	
Consuming industries, nec	385	10.9
Households	0	
Defense	735	20.8
Army		
Navy		
Air		
Inventory accretions	0	
Exports	0	
TOTAL OUTPUT	3540	100.0

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atomic energy establishment. Other large consumers are the steel industry, the chemical industry, the petroleum industry, and railroads. The largest single consumer of generators is the electric power industry.

In terms of a somewhat different industrial classification and broken down into motors and generators, the following table indicates the uses to which motors and generators are put in the USSR.

Use Pattern of Heavy Motors and Generators in the USSR
1 July 1952 to 1 July 1953

Consuming Industry	Total		Motors		Generators	
	(000kw)	%	(000kw)	%	(000kw)	%
Electric Power	1,935	39.2	142	6.0	1,793	70.0
Atomic Energy	540	11.0	284	12.0	256	10.0
Naval	293	6.0	165	7.0	128	5.0
Railroads	313	6.4	236	10.0	77	3.0
Steel	605	12.2	426	18.0	179	7.0
Chemicals, POL	378	7.7	378	16.0	-	-
Mining	165	3.4	165	7.0	-	-
Aircraft	189	3.8	189	8.0	-	-
Others	506	10.3	378	16.0	128	5.0
TOTAL	4,924	100.0	2,363	100.0	2,561	100.0

Input Structure

The heavy motors and generators industry in the Soviet Bloc is roughly comparable in size to the machine tool industry. It does not consume a large proportion of the total supply of any of the inputs that it uses, with the possible exception of copper and special types of sheet steel. The following two tables lists the inputs into the heavy motors and generators industry in the Soviet Bloc and in rounded figures for the USSR.

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Inputs into the Heavy Motors and Generators Industry of
the Soviet Bloc, 1 July 1952 to 1 July 1953

<u>Industry</u>	<u>USSR</u>	<u>European Satellites</u>	<u>Soviet Bloc</u>
Labor (man years)	89,079	61,449	150,528
Manag. and tech.	9,543	6,585	16,128
Skilled	23,261	17,059	40,320
Unskilled	56,275	37,805	94,080
Steel (mt)	33,337	24,453	57,790
Aluminum (mt)	28	21	49
Copper (mt)	2,555	1,873	4,428
Coal (mt)	71,275	52,283	123,558
Electric Power (Kwh)	126,501,555	92,776,720	219,278,275
Asbestos (mt)	5,096	3,736	8,834
Paper (mt)	814	597	1,411
Anti-friction bearings (units)	2,069	1,517	3,586
Trucks (2-ton units)	8	7	15
Rails (mt)	62	46	108
Rubber tires (units)	78	57	134
Machine tools (units)	39	29	68
Steel construction (mt)	226	166	392
Roofing tin (mt)	87	81	168
Bricks (mt)	22,251	16,317	38,568
Cement (mt)	1,306	954	2,260
Lime (mt)	435	318	753
Lumber (cu. m.)	4,347	-173- 3,186	7,533

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USSR INPUT PATTERN FOR HEAVY MOTORS AND GENERATORS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	-	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	0.1	.1
Coal (000,000,000 mt)	0.1	-
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	-	
Copper (000 mt)	-	
Aluminum (000 mt)	3.0	1
Rail transport (000,000,000 ton km)	-	
Motor transport (000,000,000 ton km)	-	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	-	
Tractors (000 - 15 hp units)	-	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	-	
Machine tools (000 units)	2.0	2.1
Ball and roller bearings (000,000 units)	-	
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	-	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	0	
Producing industries, nec	0	
Households-labor (000 man years)	90	.1
Inventory depletions	0	
Imports	1,386	

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The resources used to produce heavy motors and generators are adaptable to many other uses. The plant and equipment can be readily converted to such types of production as military ordnance and machinery. This convertability is also reversible; that is, the plant and equipment now being used to produce military hardware and certain types of machinery can be rapidly converted to the production of heavy motors and generators. It is possible that temporary bottlenecks might arise in the supply of some input, notably copper and special types of sheet steel.

Summary

The present supply position of the Soviet Bloc in regard to heavy motors and generators is satisfactory provided that the current rate of imports can be maintained and military production in electrical equipment plants not be increased. Imports constitute a substantial section (25 percent) of total domestic supply. Even in the absence of these motors and generators it is not likely that the capability of the Soviet Bloc to support military action would be severely hampered, and certainly it would not be for over a one year period. A curtailment of supply or an expansion of demand could be met temporarily by utilizing installed capacity to a greater degree than is presently done, or by shifting production away from projects with high future yield to projects with a higher

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current yield. This procedure runs the risk of being self defeating over a long period of time but in terms of the present problem is one of the methods of achieving rapid expansion of current supply if required. In addition, current production of these products can probably be expanded rapidly since resources needed to achieve this expansion are available if they can be spared from their present uses.

BALL AND ROLLER BEARING SECTOR PAPER

Ball and roller or antifriction bearings are defined in this study to include only self-contained bearing units, consisting of two concentric metal rings separated by freely moving rollers or balls. The basic types are ball bearings, self-aligning ball bearings, cylindrical roller bearings, spherical roller bearings, taper rolling bearings, needle bearings, and thrust bearings. Plain or sleeve bearings are not classified as anti-friction bearings. The bearings industry in the Soviet Bloc is a relatively small and highly specialized machinery industry.

Trends

The bearings industry in the Soviet Bloc has relied heavily on foreign technical assistance in the past. Prior to World War II, almost all machinery in the industry was imported. Soviet Bloc bearing production began during the first five year plan, reaching 3,000,000 units in 1932.

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Expansion in the industry resulted in a pre-war production peak of 36,000,000 units by 1940. During the war the industry was temporarily dislocated and the main bearing plants were over-run, but evacuation of the machinery and subsequent expansion enabled the USSR to reach a peak war level in 1944. Post war relocation caused a sag in production during 1946 and 1947, but by 1948, bearings production had passed the previous high. The table below shows the course of the bearings industry in the USSR since 1932.

Estimated Annual Production of Antifriction Bearings in the USSR
(millions of units)

<u>Year</u>	<u>Production</u>	<u>Index (1940=100)</u>
1932	3	8
1936	23	64
1940	36	100
1942	16	44
1944	40	111
1946	26	72
1947	36	100
1948	47	131
1949	60	161
1950	78	217
1951	95	264
1952	104	289
1953	111	308

There are nine plants currently producing anti-friction bearings in the USSR with a tenth under construction. The main bearing plant (Moscow) produces somewhat less than half of the total output in the USSR.

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Supply

The USSR produces a large part of the ball and roller bearings produced in the Soviet Bloc. Czechoslovakia and East Germany are the only other major Bloc producers.

Production of Anti-friction Bearings in the Soviet Bloc,
1 July 1952 to 1 July 1953

<u>Producing Country</u>	<u>Production (000 units)</u>	<u>Percent of Total</u>
USSR	108,000	84.0
Czechoslovakia	9,000	7.0
East Germany	11,000	8.6
Other Satellites	600	0.5
TOTAL	128,600	100.1

The Soviet Bloc imports substantial quantities of ball and roller bearings from Western countries, most of which go to the European Satellites. The USSR also exports a small quantity of bearings to the Satellites.

Supply of Anti-friction Bearings in the Soviet Bloc,
1 July 1952 to 1 July 1953
(000)

<u>Country</u>	<u>Production</u>	<u>Net Trade (X= - M= +)</u>	<u>Net Supply</u>
USSR	108,000	- 200	107,800
China	0	+ 350	350
Czechoslovakia	9,000	+ 4,750	13,750
East Germany	11,000	- 860	10,140
Other Satellites	600	+ 7,860	8,460
Total Bloc	128,600	+ 11,900	140,500
% of Total	91.5	8.5	100.0

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There is no indication that the Soviet Bloc stockpiles ball and roller bearings.

Pattern of Demand

Ball and roller bearings in the USSR are used entirely in the production of industrial products and equipment and military hardware. They are used most extensively in the automotive industry (31 percent) and in the production of military hardware (28 percent). The aircraft industry is the largest single military consumer of bearings.

The European Satellite allocation of anti-friction to industry is somewhat different from that in the USSR. The differences between USSR and Satellite use patterns arise in part from the fact that in the USSR the major military production sectors are located, whereas in the Satellites less final military production is undertaken and efforts are concentrated on components into the military sector.

Use Patterns of Anti-friction Bearings in Czechoslovakia,
1 July 1952 to 1 July 1953

<u>Industry</u>	<u>Units (000)</u>	<u>Percent of Total</u>
Motor Vehicle Industry	6,050	44.0
Machine Tool	620	4.5
Precision Instruments	1,720	12.5
Mining and Heavy Machinery	1,720	12.5
Other Machinery	2,820	20.5
Rail Transport	820	6.0
TOTAL	13,750	100.0

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USSR USE PATTERN FOR BALL & ROLLER BEARINGS
(000,000 units)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	0	
Textiles	0	
Electric Power	0	
Coal	0	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	29.0	26.9
Tractors	4.0	3.8
Locomotives	2.0	1.8
Rolling Stock	2.0	1.8
Coke-chemicals	0	
Rubber	0	
Machine Tools	2.5	2.3
Ball & Roller Bearings	0	
Heavy Motors & Generators	-	
Coal Mining Machinery	2.4	2.2
Electron Tubes	0	
Merchant Shipbuilding		
Construction		
Mining, n.e.c.	-	
Machinery, n.e.c.	33.3	30.8
Trade	0	
Consuming Industries, n.e.c.	2.0	1.8
Households		
Defense	30.6	28.4
Army	3.2	3.0
Navy	1.6	1.5
Air	25.8	23.9
Inventory Accretions	0	
Exports	0.2	.2
TOTAL OUTPUT	108.0	100.0

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While there is no real substitute for ball and roller bearings, there are sectors of the economy in which bearing consumption can be curtailed. Equipment and machinery can be redesigned so as to function efficiently even with a substantial cutback in the use of anti-friction bearings.

Input Pattern

The Soviet Bloc anti-friction bearing industry uses only a very small proportion of the resources available in the Bloc. Only about .2 of 1 percent of the industrial labor forces employed in the industries; only a little more than .5 of 1 percent of steel production is consumed by the industry; and about the same proportion of cutting tool production.

Summary

The Soviet Bloc has a healthy and growing ball and roller bearing industry. The production of bearings is adequate to meet the anticipated needs of their economy.

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USSR INPUT PATTERN FOR BALL AND ROLLER BEARINGS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	0.1	.1
Coal (000,000 mt)	0	
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	0.2	.8
Copper (000 mt)	0.4	.1
Aluminum (000 mt)	-	
Rail transport (000,000,000 ton km)	0	
Motor transport (000,000,000 ton km)	0	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	0.5	.5
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KVA)	-	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	0	
Producing industries, nec		
Households-labor (000 man years)	35	
Inventory depletions	0	
Imports	0	

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MINING MACHINERY

Inasmuch as the coal mining industry is an important basic industry in the Soviet Bloc, the coal mining machinery industry, which provides the equipment for extracting the coal, is of strategic importance in the Bloc's expanding economy. It is a relatively small industry.

Trends

The following table is an indication of the trends of production since 1938 for the major pieces of equipment in the coal mining machinery industry.

Soviet Bloc Production of Coal Mining Machinery (units)						
Year	Coal Loaders			Coal Cutters		
	Bloc	USSR	E. Satt.	Bloc	USSR	E. Satt.
1938	-	-	0	1,110	1,110	-
1940	-	-	0	1,050	1,050	-
1948	476	476	0	1,325	1,325	-
1949	525	525	0	1,405	1,405	-
1950	515	505	10	1,125	1,125	-
1951	775	750	25	1,135	1,100	35

Coal Combines				Total Coal Mining Machinery		
Year	Bloc	USSR	E. Satt.	Bloc	USSR	E. Satt.
1938	-	-	0	1,110	1,110	-
1940	-	-	0	1,050	1,050	-
1948	213	213	0	2,014	2,014	-
1949	216	216	0	2,146	2,146	-
1950	360	310	50	2,000	1,940	60
1951	450	340	110	2,360	2,190	170

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Supply

During the period 1952-1953 the Soviet block will manufacture about 2,550 coal mining machines of all types including loaders, combines, and cutters. The ratio of production of these three items is, in general, a 3:5:2 for loaders, cutters, and combines.

There is practically no trade in coal mining machinery. The USSR manufactures nearly all of the coal mining machinery of the Soviet Bloc.

Inventory

The park of coal mining machinery is not known.

Pattern of Demand

The entire output of the coal mining machinery industry is used in the coal mining industry.

Input Structure

The coal mining machinery industry is not a large consumer of any of the basic resources of the Soviet bloc economy. The following table will list the most important inputs into the industry in the USSR.

Summary

The coal mining machinery industry is a relatively small industrial activity in the Soviet bloc. It is of strategic importance because of the importance of the energy sector. The output of the industry is adequate to meet the cold war demands

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USSR INPUT PATTERN FOR COAL MINING MACHINERY

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	-	
Coal (000,000 mt)	0	
Petroleum (000,000 mt)	-	
Steel (000,000 mt)	0.1	.4
Copper (000 mt)	0.5	.2
Aluminum (000 mt)	-	
Rail transport (000,000,000 ton km)	-	
Motor transport (000,000,000 ton km)	-	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	6	2.2
Machine tools (000 units)	0.4	.4
Ball and roller bearings (000,000 units)	2.4	2.2
Heavy motors and generators (000 KW)	-	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	0	
Producing industries, n.e.c.		
Households-labor (000 man years)	6	-
Inventory depletions	0	
Imports	-	

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of the economy. It is a small enough industry that the inputs into the industry are relatively small compared to the other uses for the same inputs.

ELECTRON TUBES

The electron tube industry in the Soviet bloc is a relatively new and still somewhat small industry. Because of the complicated product mix in the electron tube industry, it is in general desirable to work, not in terms of physical units, but rather in terms of monetary units. For this report, U.S. dollars has been selected as this unit.

Trends

The electron tube industry in the USSR did not get under way until about 1935, and then only with the aid of imported equipment and technical aid. The industry grew very slowly during the prewar period, and had not reached a 10 million dollar rate of annual production by 1940. The slowness of the initial growth rate is probably attributable to a scarcity of the capital equipment required for the mass production of electron tubes, lack of trained personnel, and a shortage of necessary raw materials. The expansion program had originally planned to exceed \$30 million annually by 1940.

During World War II the USSR received most of her electron tube supply from the United States via Lend Lease and domestic

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production suffered a sharp decline. Postwar expansion has been very rapid since 1947, when German equipment and technicians were commandeered to build up the industry. Production will reach a \$56 million dollar annual output by 1953 in the USSR.

Supply

Electron tubes are usually divided into three categories: (1) receiving tubes and allied types, mass-produced by automatic equipment; (2) special purpose and transmitting tubes, produced in smaller quantities; and (3) cathode ray tubes, for which requirements are very small. Soviet bloc production of these tubes is concentrated in five USSR plants, with Hungary, East Germany, and Czechoslovakia being the major European Satellite producers. Present technology and equipment is up-to-date, rejects are not unusually high, and further expansion can be readily achieved if necessary.

Both East-West and intra-bloc trade in electron tubes are relatively unimportant.

Distribution of total Soviet bloc supply is shown on the following page.

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Estimated Supply of Electron Tubes in the Soviet Bloc,
 1 July 1952 to 1 July 1953
 (Millions of US dollars)

<u>Country</u>	<u>Production</u>	<u>Net Imports</u> (X - , M +)	<u>Supply</u>	<u>Percent of total supply</u>
USSR	52.0	- 0.1	51.9	75
Czechoslovakia	3.0	+ 0.6	3.6	5
Hungary	6.0	- 2.4	4.6	7
E. Germany	5.5	- 0.1	5.4	8
Other Satellites	#	- 3.4	3.4	5
Total	<u>66.5</u>	<u>+ 1.4</u>	<u>67.9</u>	<u>100</u>

Inventory

Nothing is known of stockpiles of electron tubes in the Soviet bloc.

Pattern of Demand

Most of the Soviet bloc production of electron tubes is used by the military establishment. Consumer goods industries receive a significant proportion of electron tubes in the European Satellites. The following table showing the USSR use pattern and the use pattern for the USSR and the European Satellites and China are shown below.

USSR Electron Tube Use Pattern 1952-1953
 (000,000 US \$)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>%</u>
Consuming Industries, n.e.c.	8.3	16.0
Households	6.7	12.9
Military	36.9	70.9
Export	0.1	0.2
Total	<u>52.0</u>	<u>100.0</u>

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USSR USE PATTERN FOR ELECTRON TUBES
(000,000 US \$)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	0	
Textiles	0	
Electric power	0	
Coal	0	
Petroleum	0	
Steel	0	
Copper	0	
Aluminum	0	
Rail transport	0	
Motor transport	0	
Water transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling stock	0	
Coke-chemicals	0	
Rubber	0	
Machine tools	0	
Ball and roller bearings	0	
Heavy motors and generators	0	
Coal mining machinery	0	
Electron tubes	--	
Merchant shipbuilding	0	
Construction	0	
Mining, nec	0	
Machinery, nec	--	
Trade	0	
Consuming industries, nec	8.3	16.0
Households	6.7	12.9
Defense	36.9	70.9
Army		
Navy		
Air		
Inventory accretions	0	
Exports	0.1	.2
TOTAL OUTPUT	52.0	100.0

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S-E-C-R-E-TEstimated Use Pattern of Electron Tubes in the Soviet Bloc,
1 July 1952 to 1 July 1953

<u>Consuming Industry</u>	<u>USSR</u>	<u>%</u>	<u>Satellites and China</u>	<u>%</u>	<u>Soviet Bloc</u>	<u>Percent of Total</u>
Households	6.7	13	6.9	43	13.6	20.0
Military	36.9	71	6.8	43	43.7	64.4
Industry, n.e.c.	8.3	16	2.3	14	10.6	15.6
Total	<u>51.9</u>	<u>100</u>	<u>16.0</u>	<u>100</u>	<u>67.9</u>	<u>100.</u>

The difference between the Soviet Bloc use pattern and the United States use pattern of electron tubes is considerable. The United States production was roughly 50 times that of Soviet Bloc production for 1951. United States production for military purposes alone was roughly 20 times that of total Soviet Bloc production. The following table compares US and Soviet Bloc use patterns.

Comparison of US and USSR Use Patterns for Electron Tubes,
in Percentage Terms

<u>Consuming Industry</u>	<u>US (1951)</u>	<u>US (1952)</u>	<u>Soviet Bloc (1952-1953)</u>
Households	40	24	20
Military	30	57	64
Industries, n.e.c.	<u>30</u>	<u>19</u>	<u>16</u>
Total	100	100	100

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The input structure for electron tubes in the Soviet bloc is given below. Many of these inputs are highly specific to the electron tube industry and cannot be easily substituted for.

Estimated Input Pattern of Electron Tubes in the Soviet Bloc,
1 July 1952 to 1 July 1953
(Metric Tons unless otherwise noted)

<u>Industry</u>	<u>USSR</u>	<u>Satellites</u>	<u>Soviet Bloc</u>
Labor (man years)	33,000	14,300	47,300
Mang. and tech.	3,960	1,720	5,680
Skilled and unskilled	29,040	12,580	41,620
Tungsten	32.5	6.5	38.9
Molybdenum	34.0	12.7	46.7
Nickel	180	72	252
Mica (raw block)	395	102	496
Glass (technical)	2,500	700	3,200
Coal	—	—	48.4
Electric Power (000 kwh)	13,000	3,600	16,600
Machine Tools (000 units)	0.1	—	0.1

Many of the electron tube inputs do not have good substitutes, so that a supply interdiction of such items as mica, tungsten, wire, special nickel products, molybdenum wire or capacitor paper would cause a substantial decline in production. These inputs are not domestically produced in sufficient quantities to cover present production. However, the quantities involved are small enough so that even if trade were cut off, the necessary quantities could be clandestinely procured with little difficulty.

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Summary

The electron tube industry in the Soviet bloc is of strategic importance and is not as yet on a firm footing. Production is far below that which would be desired for the maintenance of large armed forces. The primary limiting factors are the highly specific raw materials needed for the industry. The equipment necessary for the manufacture of tubes is also highly specialized and is difficult to produce. From an aggregative point of view, the industry is very small and does not impose any burden upon the economy as a whole; however, its extreme importance in communications, especially military communications makes it one of the most strategic industries of the Soviet bloc.

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I. RAIL TRANSPORT

The growth of the rail transport industry in the Soviet Bloc has been a fundamental determinant of the rate of growth of the economy as a whole. The critical role of rail transport became evident in the USSR during the early 1930's when inadequate rail facilities, resulting from previous economy in railroad capital investment, were confronted by a huge back log of unshipped freight.

Rail transport is also a vital consideration in the planning of industrial location. The demands imposed on the rail transport sector of the economy can be lightened by reducing the volume of interregional transport which in turn can be lightened by developing more or less self-contained industrial regions. Since the early 1930's, regional self-sufficiency has been an admitted objective of Soviet planning.

Trends

The development of the USSR rail network prior to the Revolution of 1917, was concentrated largely in the area west of Moscow and it was only after the revolution the development of other facilities was undertaken.

During World War II, rail lines in the western area of the USSR were severely damaged, and the length of track in use was reduced by 40 percent during the period 1941-1943.

S-E-C-R-E-TRail Transport in the Soviet Bloc
(000,000 ton kil.)

<u>Year</u>	<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>European Satellites</u>
1939	--	392,000	600	--
1942	--	223,000	470	--
1948	517,353	450,000	4,800	62,553
1949	--	525,000	--	68,420
1950	713,840	601,000	32,300	80,540
1951	806,190	672,000	43,100	91,090

In terms of ton-kilometers of freight by 1948, the USSR had surpassed its prewar volume of 392 billion by about 60 billion. From 1948 to 1951 the percentage increase in ton-kilometers for both the USSR and the European Satellites was roughly 50 percent. The huge increase in rail freight in China from 1948 to 1949 was accounted for largely by the cessation of hostilities between the Nationalist and Communist forces.

Supply

Rail transport of freight for the Bloc as a whole for the period 1 July 1952 to 1 July 1953 is expected to be about 910 billion ton-kilometers, an increase of 13 percent over 1951. Transport in the USSR, increasing to 770 billion ton-kilometers, will be 15 percent higher than in 1951.

Soviet Bloc Rail Transport Supply, 1952-1953
(000,000,000 ton km.)

<u>Bloc</u>	<u>USSR</u>	<u>China</u>	<u>E. Satellites</u>
910	770	42	78

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S-E-C-R-E-TPattern of Demand

The coal industry is the largest consumer of rail transport services in the USSR, accounting for 20.8 percent of the total. Transportation of construction materials other than steel, accounts for 19.4 percent of the total rail transport followed by rail transport and steel.

A breakdown of freight volume by commodity, by average length of haul and by freight originating yields a more meaningful picture of the transport process. Coal has close to the shortest average haul and at the same time originates by far the largest volume of freight.

Average Haul and Freight Originating for Selected Commodities
USSR Railroads-1950 1/

Commodity	Ton-kilometers (000,000,000)	Average Haul (kilometers)	Freight Originating (000,000 mt)
Coal and Coke	156.0	640-660	240
Ore	25.0	560-580	44
Iron and Steel	41.7	900-1000	44
Petroleum	34.3	940-1000	35
Construction Timber	91.5	1000-1100	87
Grain	22.3	700-750	31

1/ Data based on 1950 Five Year Plan.

Input Structure

The rail transport industry is the largest single user of coal in the USSR economy, consuming 85 million metric tons or 27 percent of total domestic production. This coal input is made up of 75 million tons of hard coal and 10 million tons

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USSR USE PATTERN FOR RAIL TRANSPORT
(000,000,000 ton km.)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	30	3.9
Textiles	-	
Electric Power	0	
Coal	160	20.8
Petroleum	40	5.2
Steel	100	13.0
Copper		
Aluminum		
Rail Transport	110	14.9
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	-	
Rubber	-	
Machine Tools	-	
Ball & Roller Bearings	0	
Heavy Motors & Generators	-	
Coal Mining Machinery	-	
Electron Tubes	0	
Merchant Shipbuilding	-	
Construction	150	19.4
Mining, n.e.c.	20	2.6
Machinery, n.c.c.		
Trade		
Consuming Industries, n.e.c.	160	20.8
Households		
Defense		
Army		
Navy		
Air		
Inventory Accretions	0	
Exports	0	
TOTAL OUTPUT	770	100.0

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USSR INPUT PATTERN FOR RAIL TRANSPORT

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	-	
Electric power (000,000,000 KWH)	4.0	3.2
Coal (000,000 mt)	85.0	27.3
Petroleum (000,000 mb)	3.0	7.2
Steel (000,000 mt)	2.1	8.4
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)	110	14.9
Motor transport (000,000,000 ton km)	1.7	5.4
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	1700	97.1
Rolling stock (000 - 2 axle units)	152	100
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	0	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	200	5.6
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	5.5	5.5
Trade (%)	3.0	3.0
Producing industries, ncc		
Households-labor (000 man years)	2100	2.4
Inventory depletions	0	
Imports	0	

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of soft coal. Electric power and petroleum are consumed by the electrified and dieselized sectors of the railroad industry. Petroleum is also utilized by oil-burning steam locomotives. The steel input is that amount used in steel rail manufacture. With a labor input of 2.1 million man years, rail transport is one of the larger industrial employers of manpower.

Summary

Rail transport facilities will be adequate for the demands imposed upon it. Having experienced a critical transportation bottleneck in the early 1930's, the USSR is careful to devote sufficient resources to railroad expansion in order to keep pace with the growth of the economy as a whole. Short-run demand in excess of supply can be partly shunted to water transport facilities.

MOTOR AND WATER TRANSPORT

The motor and water transport industries comprise only a small part of the total transport facilities of the Soviet Bloc, amounting to about 15-20 percent of the total ton-kilometers of freight in 1953. This is due to the relatively small stock of trucks in the Bloc as a whole, to the relative ease of track construction on the vast plains, the lack of a paved highway truck-line system, and the freezing of rivers during much of the year.

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Road transport is largely confined to urban areas. A large volume of freight is moved by motor truck but only for relatively short distances. Development of long distance hauling awaits hard surface highways, increased truck production and adequate supplies of gas and oil from the petroleum sector of the economy.

USSR water transport is divided fairly equally, on a ton-kilometers basis, between the river and maritime sectors. River transport, which is characterized by marked seasonal activity is utilized principally for the shipment of such bulky materials as coal, petroleum, lumber and cement. Maritime shipping, which is also seasonal because of ice-blocked ports, is largely between ports of the USSR.

Trends

Motor transport in the USSR in 1951 had more than tripled prewar activity, while water transport (river plus maritime) had increased by about 37 percent.

Motor Transport
(000,000,000 ton kil.)

<u>Year</u>	<u>USSR</u>
1938	8.3
1940	9.0
1948	9.7
1949	---
1950	25.4
1951	---

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Year	Water Transport*			Ocean Transport		
	Bloc	USSR	E. Sat.	Bloc	USSR	E. Sat.
1938	---	32.0	---	---	33.9	---
1940	---	36.0	---	---	23.0	---
1948	33.9	31.1	2.8	38.8	33.8	5.0
1949	41.0	37.6	3.4	41.2	35.8	5.4
1950	49.2	45.2	4.0	43.9	38.0	5.9
1951	55.5	51.0	4.5	47.8	41.0	6.8

* Excludes ocean and Caspian Sea Transport.

In the postwar period, as well as during prewar years, there has been a tendency to under-utilize river transport facilities in the USSR due, in part, to slowness of transport, poor scheduling and lack of transfer points. However, an objective of the Fifth Five Year Plan is to increase river transport by 75 to 80 percent. While this is much higher than the planned increase of 35-40 percent for railroads, the percentage increase in rail transport is applied to a much larger base of activity than is the case of river transport.

Supply

It is estimated for the period 1 July 1952 to 1 July 1953, that motor transport in the USSR will attain a level of 31.5 billion ton-kilometers. No estimates have been made for China or the European Satellites because of a lack of historical data.

Water transport (river plus maritime) for the Bloc will be 143.6 billion ton-kilometers which is an increase of almost

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40 percent over 1951. This percentage increase is considerably in excess of that for motor transport which will be about 24 percent. This reflects the concerted effort of the USSR to increase its merchant ship tonnage.

Pattern of Demand

The demand for motor transport in the USSR arises mainly from the household, trade agriculture and military sectors of the economy. Transport for the household and trade sectors is almost wholly within urban areas and agricultural freight is largely composed of fruit and vegetable, farm-to-market produce.

Approximately 38 percent of the total ton-kilometrage of water transport will be allocated to the shipment of petroleum and petroleum products. Information is lacking for other consuming sectors.

To a limited extent water transport can be substituted for rail transport. The amount of unused shipping facilities and their location, and speed of transport are limitations on the substitutability.

Input Structure

The motor transport industry is the largest single user of petroleum in the USSR economy, consuming about 24 percent of total domestic production. Almost half, 49 percent, of the output of the truck industry is funnelled into the transport industry. The labor input of 2.6 million man years exceeds the labor input for rail transport by .5 million man years.

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USSR USE PATTERN FOR MOTOR TRANSPORT
(000,000,000 ton km.)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	3.6	11.4
Textiles	0.6	1.9
Electric Power	0.3	1.0
Coal	0.6	1.9
Petroleum	0.9	2.9
Steel	0.6	1.9
Copper	0.3	1.0
Aluminum	0.3	1.0
Rail Transport	1.7	5.4
Motor Transport	0.3	1.0
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	-	
Rubber	-	
Machine Tools	-	
Ball & Roller Bearings	0	
Heavy Motors & Generators	-	
Coal Mining Machinery	-	
Electron tubes	0	
Merchant Shipbuilding	-	
Construction	-	
Mining, n.e.c.	-	
Machinery, n.e.c.	2.2	7.0
Trade	6.4	20.2
Consuming Industries, n.e.c.	1.9	6.0
Households	9.6	30.4
Defense	2.2	7.0
Army	-	
Navy	-	
Air	-	
Inventory Accretions	0	
Exports	0	
TOTAL OUTPUT	31.5	100.0

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S-E-C-R-E-T

S-E-C-R-E-T

USSR USE PATTERN FOR WATER TRANSPORT
(000,000,000 ton km.)

<u>Concuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	-	
Textiles	-	
Electric power	0	
Coal	-	
Petroleum	49.0	37.8
Steel	-	
Copper	-	
Aluminum	-	
Rail Transport	0	
Motor Transport	0	
Water Transport	0	
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling Stock	0	
Coke-chemicals	0	
Rubber	0	
Machine Tools	0	
Ball and Roller Bearings	0	
Heavy Motors and Generators	0	
Coal Mining Machinery	0	
Electron Tubes	0	
Merchant Shipbuilding	0	
Construction	0	
Mining, n.e.c.	0	
Machinery, n.e.c.	-	
Trade	-	
Consuming Industries, n.e.c.	80.7	62.2
Households	-	
Defense	-	
Army	-	
Navy	-	
Air	-	
Inventory Accretions	0	
Exports	0	
Total Output	129.7	100.0

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S-E-C-R-E-T

S-E-C-R-E-T

Water transport consumes considerably less of the economy's resources than do motor and rail transport. The primary input, of course, is the 81 thousand gross registered tons of merchant shipbuilding which will be built. The remaining inputs are the energy resources utilized as fuel for the entire shipping fleet and the manpower required for operation and maintenance.

Summary

Sufficient inputs will be available for the estimated expansion of the motor and water transport industries. Motor and water facilities will continue to play a relatively small but significant part in the movement of freight.

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR MOTOR TRANSPORT

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	-	
Electric power (000,000,000 KWH)	0.1	.1
Coal (000,000 mt)	0	
Petroleum (000,000 mt)	10.0	23.8
Steel (000,000 mt)	0.4	1.6
Copper (000 mt)	0	
Aluminum (000 mt)	2	.7
Rail transport (000,000,000 ton km)	0	
Motor transport (000,000,000 ton km)	0.3	1.0
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	305	49.0
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	100	36.2
Machine tools (000 units)	0	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	0	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	4.5	4.5
Trade (%)	1.5	1.5
Producing industries, nec		
Households-labor (000 man years)	2600	2.9
Inventory depletions	0	
Imports	0	

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR WATER TRANSPORT

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	-	
Electric power (000,000,000 KWH)	0	
Coal (000,000 mt)	1.0	•3
Petroleum (000,000 mt)	1.8	4.3
Steel (000,000 mt)	0	
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)	0	
Motor transport (000,000,000 ton km)	0	
Water transport (000,000,000 ton km)	0	
Trucks (000 - 2 ton units)	0	
Tractors (000 - 15 hp units)	0	
Locomotives (units)	0	
Rolling stock (000 2 + axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	0	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	0	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	81	100
Construction (%)	3.5	3.5
Trade (%)	0.5	0.5
Producing industries, ncc		
Households-labor (000 man years)	240	.3
Inventory depletions	0	
Imports	0	

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR TRANSPORTATION

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	0	
Meat 000,000 mt	0	
Fats and oils 000 mt	0	
Cotton 000 mt	0	
Wool 000 mt	0	
Hemp 000 mt	1	
Electric power 000,000,000 kwh	4.1	3.3
Coal 000,000 ,t	86.0	27.6
Petroleum 000,000 mt	14.8	35.3
Steel 000,000 ,t	2.5	10.4
Copper 000 mt	0	
Aluminum 000 mt	2	.7
Rail transport 000,000,000 ton km	110	14.3
Motor transport 000,000,000 ton km	2.0	6.4
Water transport 000,000,000 ton km		
Trucks 000-2 ton units	305	49.0
Tractors 000-15 hp units	0	
Locomotives units	1700	97.1
Rolling stock 000-2 axle units	152	100.0
Refined benzol 000 mt	0	
Toluol 000 mt	0	
Phenol 000 mt	0	
Rubber 000 mt	100	36.2
Machine tools 000 units	0	
Ball and roller bearings 000,000 units	0	
Heavy motors and generators 000 kw	200	5.6
Coal mining machinery units	0	
Electron tubes 000,000 US \$	0	
Merchant shipbuilding 000 GRT	81	100.0
Construction %	13.5	13.5
Trade %	5.0	5.0
Producing industries, nec		
Households-labor 000 manyears	4940	5.6
Inventory depletions	0	
Imports		

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S-E-C-R-E-T

S-E-C-R-E-T

PART IV

J. CONSTRUCTION

Construction is not only one of the most important activities of the Soviet Bloc, but is the largest single flexible sector in the economy.

Investment represents about 25 percent of the total effort of the economy of the USSR in value terms. Since 62.5 percent is devoted to construction, nearly 16 percent of the economy's effort is applied to construction activity. Of the total construction, slightly more than 60 percent is devoted to industrial construction, hence, slightly less than 10 percent of the national economic effort is applied to industrial construction.

Since construction cannot be measured in physical units, the ruble value of construction has been put on a percentage basis and distributed over its various uses

USSR Use Pattern for Construction

<u>Consuming Industry</u>	<u>Percentage</u>
Manufacturing, n.e.c.	16.3
Chemicals	4.7
Construction Materials	0.9
Paper	0.8
Other	9.9
Households	21.3
Housing	14.4
Light Industry	2.9
Food Industry	4.0

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S-E-C-R-E-T

S-E-C-R-E-T

Residential housing is the largest single consumer of construction, with 14.4 percent.

<u>Consuming Industry</u>	<u>Percent</u>
Gross Industrial Construction	61.0
Housing	14.4
Transportation and Communication	13.5
Agriculture	<u>11.1</u>
	100.0

Gross industrial construction includes various fixed facilities, such as mines and oil wells and installation of equipment. Transportation includes roads, canals, port facilities, airports, pipelines, and telephone and telegraph lines. Construction in agriculture is for farm buildings, irrigation and drainage, and conservation improvements.

The most important inputs, aside from labor, are building materials and transportation. The following tabulations show the inputs of the rest of the economy and the inputs of building materials.

It is to be noted that the labor input is substantially understated. The figure does not include the slave laborers who are engaged primarily in construction work of some kind.

The importance of construction resides in (1) the size of the industry, (2) its flexibility among users, and (3) its importance in total investment. In case of mobilization or war, resources used in this industry can be readily switched to other uses.

S-E-C-R-E-TConstruction Materials in the Soviet Bloc

	<u>1938</u>	<u>1940</u>	<u>1947</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952-53</u>
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Gypsum (000 mt)								
USSR (Bloc)	999	725	652	924	1,232	1,470	1,736	2,000

Cement (Hydraulic) (000,000 mt)								
---------------------------------	--	--	--	--	--	--	--	--

Bloc	--	--	9.0	11.6	14.6	17.1	19.6	--
USSR	5.7	5.3	4.8	6.6	8.8	10.5	12.4	15.0
China	1.0	1.0	0.6	0.7	0.8	0.9	1.0	--
E. Sats.	--	--	3.6	4.3	5.0	5.7	6.2	--

Flat Glass (000,000 m ²)								
--------------------------------------	--	--	--	--	--	--	--	--

USSR	--	50.0	50.8	60.9	75.0	80.0	83.0	90.0
------	----	------	------	------	------	------	------	------

Unglazed Bricks (000,000,000 units)								
-------------------------------------	--	--	--	--	--	--	--	--

Bloc	--	--	--	--	--	12.7	15.3	--
USSR	8.7	7.2	4.4	6.9	8.0	9.6	12.3	14.0
E. Sats.	--	--	--	--	--	3.1	3.0	--

Asbestos (000 mt)								
-------------------	--	--	--	--	--	--	--	--

USSR (Bloc)	86.0	84.0	75.0	90.0	95.0	100.0	110.0	110.0
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S-E-C-R-E-T

S-E-C-R-E-T

USSR USE PATTERN FOR CONSTRUCTION
(%)

<u>Concuning Industry</u>	<u>Percentage</u>
Agriculture	11.1
Textiles	2.4
Electric power	4.6
Coal	5.5
Petroleum	4.7
Steel	6.8
Copper	1.8
Aluminum	2.0
Rail transport	5.5
Motor transport	4.5
Water transport	3.5
Trucks	
Tractors	
Locomotives	
Rolling stock	
Coke-chemicals	
Rubber	
Machine tools	
Ball and roller bearings	
Heavy motors and generators	
Coal mining machinery	
E lectron tubes	
Construction	
Mining, nec	
Machinery, nec	10.0
Trade	0
Consuming industries, nec	16.3
Households	21.3
Defense	
Army	
Navy	
Air	
Inventory accretions	
Exports	
TOTAL OUTPUT	100.0

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR CONSTRUCTION

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	0	
Meat 000,000 mt	0	
Fats and oils 000 mt	0	
Cotton 000 mt	--	
Wool 000 mt	0	
Hemp 000 mt	0	
Electric power 000,000,000 KWH	--	
Coal 000,000 mt	--	
Petroleum 000,000 mt	--	
Steel 000,000 mt	4.2	16.8
Copper 000 mt	25.0	8.3
Aluminum 000 mt	12	3.9
Rail transport 000,000,000 ton km	150	19.4
Motor transport 000,000,000 ton km		
Water transport 000,000,000 ton km	0	
Trucks 000-2 ton units		
Tractors 000-15 hp units	29	7.5
Locomotives units	0	
Rolling stock 000-2 axle units	0	
Refined benzol 000 mt	0	
Toluol 000 mt	0	
Phenol 000 mt	0	
Rubber 000 mt		
Machine tools 000 units	1.0	1.0
Ball and roller bearings 000,000 units		
Heavy motors and generators 000 kw	--	
Coal mining machinery units	0	
Electron tubes 000,000 US \$	0	
Merchant shipbuilding 000 GRT	0	
Construction %		
Trade %		
Producing industries, nec	6	
Households-labor 000 man years	3200	3.6
Inventory depletions	0	
Imports	0	
Excavators (units)	5500	100

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S-E-C-R-E-T

S-E-C-R-E-T

PART IV

K. HOUSEHOLD SECTOR

Consumption levels in the Soviet Bloc are in general lower than they are in the West. In the USSR about 50 to 55 percent goes to household consumption. In the European Satellites the percentage is slightly higher, but in China a higher percentage is consumed by households, since the economy is relatively under-developed. In the West the ratio of consumption to total output is more than 60 percent.

The tabulations which follow indicate the quantities of resources going to wholesale and retail trade and to final household consumption. In addition, there are tables indicating the allocation of the labor force and trade among industries.

S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR TRADE

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain (000,000 mt)	0	
Meat (000,000 mt)	0	
Fats and oils (000 mt)	0	
Cotton (000 mt)	0	
Wool (000 mt)	0	
Hemp (000 mt)	0	
Electric power (000,000,000 KWH)	.5	.4
Coal (000,000 mt)	0	
Petroleum (000,000 mt)	0	
Steel (000,000 mt)	0	
Copper (000 mt)	0	
Aluminum (000 mt)	0	
Rail transport (000,000,000 ton km)		
Motor transport (000,000,000 ton km)	6.4	20.2
Water transport (000,000,000 ton km)		
Trucks (000 - 2 ton units)		
Tractors (000 - 15 hp units)		
Locomotives (units)	-	
Rolling stock (000 - 2 axle units)	0	
Refined benzol (000 mt)	0	
Toluol (000 mt)	0	
Phenol (000 mt)	0	
Rubber (000 mt)	0	
Machine tools (000 units)	-	
Ball and roller bearings (000,000 units)	0	
Heavy motors and generators (000 KW)	0	
Coal mining machinery (units)	0	
Electron tubes (000,000 US \$)	0	
Merchant shipbuilding (000 GRT)	0	
Construction (%)	0	
Trade (%)	1.0	1.0
Producing industries, nec		
Households-labor (000 man years)	3200	3.6
Inventory depletions	0	
Imports	0	

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR HOUSEHOLDS

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	44.3	48.2
Meat 000,000 mt	3.8	88.4
Fats and oils 000 mt	1210	60.5
Cotton 000 mt	480	50.0
Wool 000 mt	36	41.9
Hemp 000 mt	57	30.6
Electric power 000,000,000 kwh	18.0	14.5
Coal 000,000 mt	20.0	6.4
Petroleum 000,000 mt	2.3	5.5
Steel 000,000 mt		
Copper 000 mt	29.0	9.7
Aluminum 000 mt	35	11.4
Rail transport 000,000,000 ton km		
Motor transport 000,000,000 ton km	9.6	30.4
Water transport 000,000,000 ton km		
Trucks 000-2 ton units		
Tractors 000-15 hp units		
Locomotives units	0	
Rolling stock 000-2 axle units	0	
Refined benzol 000 mt	-	
Toluol 000 mt	-	
Phenol 000 mt	-	
Rubber 000 mt	44	15.9
Machine tools 000 units	0	
Ball and roller bearings 000,000 units		
Heavy motors and generators 000 kw.	0	
Coal mining machinery units	0	
Electron tubes 000,000 US \$	6.7	12.9
Merchant shipbuilding %	0	
Construction %	21.3	21.3
Trade %	32.0	32.0
Producing industries, nec		
Households-labor 000 manyears	10,000	11.3
Inventory depletions		
Imports		

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S-E-C-R-E-T

S-E-C-R-E-T

USSR USE PATTERN FOR HOUSEHOLD
(000 manyears)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	51,300	57.8
Textiles	1,200	1.4
Electric Power	330	.4
Coal	1,000	1.1
Petroleum	310	.4
Steel	920	1.0
Copper	50	.1
Aluminum	100	.1
Rail Transport	2,100	2.4
Motor Transport	2,600	2.9
Water Transport	240	.3
Trucks	165	.2
Tractors	90	.1
Locomotives	25	-
Rolling Stock	40	-
Coke-chemicals		
Rubber	275	.3
Machine Tools	100	.1
Ball & Roller Bearings	35	-
Heavy Motors & Generators	90	.1
Coal Mining Machinery	6	-
Electron Tubes		
Merchant Shipbuilding	40	-
Construction	3,200	3.6
Mining, n.e.c.		
Machinery, n.e.c	2,200	2.5
Trade	3,200	3.6
Consuming Industries, n.e.c.	4,834	5.4
Households	10,000	11.3
Defense	4,350	4.9
Army	2,900	3.3
Navy	700	.8
Air	750	.8
Inventory Accretions	0	
Exports	0	
TOTAL OUTPUT	88,800	100.0

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S-E-C-R-E-T

TOTAL POPULATION AND EMPLOYMENT BY INDUSTRY OF THE SOVIET BLOC, 1952

Units: Thousands

S-E-C-R-E-T

TABLE B
OCCUPATIONAL DISTRIBUTION OF NON-AGRICULTURAL WORKERS AND EMPLOYEES IN THE USSR 1947-1952 1/
(In Thousands)

	1947	1948	1949	1950	1951	1952
Workers And Employees 2/	32,200	35,400	35,400	37,200	39,200	40,800
I Industry	9,900	10,700	11,600	12,500	13,700	14,400
Electric Power	273	286	299	312	325	330
Petroleum	300	300	300	300	300	307
Coal	290	380	915	930	950	950
Ferrous Metallurgy	300	465	627	785	890	908
Non Ferrous Metallurgy	235	270	310	345	375	385
Metal Working, Machine Construction	3,700	5,900	4,100	4,500	4,500	4,635
Timber	420	430	440	450	460	469
Chemical	132	198	264	328	390	398
Textile	500	600	800	900	1,000	1,014
Fish	141	152	167	178	189	192
Food	725	850	975	1,100	1,200	1,224
Meat and Dairy	210	220	235	245	254	259
Paper	85	90	100	105	110	110
Industry, n.e.c.	2,599	2,559	2,368	2,322	2,757	3,219
Construction	2,600	2,600	2,750	2,950	3,000	3,150
III Rail Transport	1,750	1,800	1,850	1,950	2,000	2,050
IV Water Transport	215	215	220	225	230	235
V Other Transport	2,425	2,425	2,450	2,475	2,500	2,525
VI Education	2,550	2,650	2,800	3,000	3,200	3,400
VII Public Health	1,500	1,350	1,400	1,450	1,500	1,550
VIII Trade	2,970	2,970	2,980	3,040	3,100	3,160
IX Public Feeding	970	970	980	990	1,000	1,010
X Credit	335	335	340	345	350	355
XI Dwelling, Communal Economy	1,140	1,140	1,160	1,180	1,200	1,220
XII State and Public Institutions	2,170	2,170	2,180	2,190	2,200	2,210
XIII Art	235	235	240	245	250	255
XIV Communications	570	570	580	590	600	610
XV State Agriculture, Forestry	1,600	1,800	2,200	2,600	2,900	3,260
XVI Other n.e.c.	1,470	1,470	1,470	1,470	1,470	1,480

1. All figures in this table are from NIE-65 working papers.

2. Figures for total nonagricultural workers and employees may be obtained by subtracting annual increments announced for the respective years. SECRET -218-

S-E-C-R-E-T

USSR USE PATTERN FOR TRADE
(%)

<u>Consuming Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Agriculture	4.0	4.0
Textiles	12.0	12.0
Electric power	1.0	1.0
Coal	1.0	1.0
Petroleum	1.5	1.5
Steel	4.5	4.5
Copper	1.5	1.5
Aluminum	1.5	1.5
Rail transport	3.0	3.0
Motor transport	1.5	1.5
Water transport	0.5	0.5
Trucks	0	
Tractors	0	
Locomotives	0	
Rolling stock	0	
Coke-chemicals	0	
Rubber	—	
Machine tools	0	
Ball and roller bearings	0	
Heavy motors and generators	0	
Coal mining machinery	0	
Electron tubes	0	
Merchant shipbuilding	0	
Construction	0	
Mining, nec	0	
Machinery, nec	9.0	9.0
Trade	1.0	1.0
Consuming industries, nec	6.0	6.0
Households	32.0	32.0
Defense	20.0	20.0
Army		
Navy		
Air		
Inventory accretions	0	
Exports	0	
TOTAL OUTPUT	100.0	100.0

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S-E-C-R-E-T

S-E-C-R-E-T

PART IV

L. MILITARY SECTOR

The military sector consists of the military establishment (Army, Navy, and Air), those plants and parts of plants manufacturing items for military consumption, and research and development for military purposes.

In the USSR about 20 percent of the national economic effort is in the military sector. The same is true of the European Satellites; the percentage is probably greater in China.

The military sector is a large consumer of basic resources. The manpower in the military establishment is indicated in tables in the Household Sector. The following tabulations show the quantities of resources used by the military and unit requirements of selected inputs for military end items.

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S-E-C-R-E-T

S-E-C-R-E-TWEAPONS

Type Weapon	Unit Weight lbs.	Ingot Steel lbs./lb.	Ingot Aluminum lbs./lb.	Refined Copper lbs./lb.	Refined Zinc lbs./lb.	Elec. Power kwh/lb.	Man Power mh/lb.
Small Arms	27	3.25	.002	.0014	.0006	13.77	1.02
Side Arms	6	4.89	.004	.0049	.0021	9.22	1.00
Machine Guns	59	3.00	.019	.0007	.0003	14.44	1.03
Mortars	611	1.70	.007	.070	.030	1.31	1.19
Light Artillery	2,263	3.56	.003	.023	.010	0.68	1.52
Medium Artillery	7,425	3.32	neg.	.024	.011	0.61	0.89
Heavy Artillery	14,836	2.94	.0001	.014	.006	1.75	0.83
Naval Rifles	33,930	3.33	.011	.155	.066	2.12	0.80

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR NAVY

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt		
Meat 000,000 mt		
Fats and oils 000 mt		
Cotton 000 mt		
Wool 000 mt		
Hemp 000 mt		
Electric power 000,000,000 kwh		
Coal 000,000 mt		
Petroleum 000,000 mt		
Steel 000,000 mt		
Copper 000 mt		
Aluminum 000 mt	25	8.1
Rail transport 000,000,000 ton km		
Motor transport 000,000,000 ton km		
Water transport 000,000,000 ton km		
Trucks 000-2 ton units		
Tractors 000-15 hp units		
Locomotives units	0	
Rolling stock 000-2 axlc units	0	
Refined benzol 000 mt		
Toluol 000 mt		
Phenol 000 mt		
Rubber 000 mt		
Machine tools 000 units	2.9	3.0
Ball and roller bearings 000,000 units	1.6	1.5
Heavy motors and generators 000 kwh		
Coal mining machinery units	0	
Electron tubes 000,000 US\$		
Merchant shipbuilding 000 GRT	0	
Construction %	0	
Trade %		
Producing industries, nec		
Households-labor 000 manyears	700	.8
Inventory depletions		
Imports		

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR AIR

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt		
Meat 000,000 mt		
Fats and oils 000 mt		
Cotton 000 mt		
Wool 000 mt		
Hemp 000 mt		
Electric power 000,000,000 kwh		
Coal 000,000 mt		
Petroleum 000,000 mt		
Steel 000,000 mt		
Copper 000 mt		
Aluminum 000 mt	60	19.5
Rail transport 000,000,000 ton km		
Motor transport 000,000,000 ton km		
Water transport 000,000,000 ton km		
Trucks 000-2 ton units		
Tractors 000-15 hp units		
Locomotives units	0	
Rolling stock 000-2 axle units	0	
Refined benzol		
Toluol 000 mt		
Phenol 000 mt		
Rubber 000 mt		
Machine tools 000 units	8.7	9.0
Ball and roller bearings 000,000 units	25.8	23.9
Heavy motors and generators 000 kw		
Coal mining machinery units	0	
Electron tubes 000,000 US \$		
Merchant shipbuilding 000 GRT	0	
Construction %	0	
Trade %		
Producing industries, nec		
Households-labor 000 manyears	750	8
Inventory depletions		
Imports		

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR ARMY

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt		
Meat 000,000 mt		
Fats and oils 000 mt		
Cotton 000 mt		
Wool 000 mt		
Hemp 000 mt		
Electric power 000,000,000 kwh		
Coal 000,000 mt		
Petroleum 000,000 mt		
Steel 000,000 mt		
Copper 000 mt		
Aluminum 000 mt	15	4.9
Rail transport 000,000,000 ton km		
Motor transport 000,000,000 ton km		
Water transport 000,000,000 ton km		
Trucks 000-2 ton units		
Tractors 000-15 hp units		
Locomotives units	0	
Rolling stock 000-2 axle units	0	
Refined benzol 000 mt		
Toluol 000 mt		
Phenol 000 mt		
Rubber 000 mt		
Machine tools 000 units	6.8	7.0
Ball and roller bearings 000,000 units	3.2	3.0
Heavy motors and generators 000 kwh	0	
Coal mining machinery units		
Electron tubes 000,000 US \$		
Merchant shipbuilding 000 GRT	0	
Construction %	0	
Trade %		
Producing industries, noc		
Households-labor 000 manycars	2900	3.3
Inventory depletions		
Imports		

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S-E-C-R-E-T

S-E-C-R-E-T

USSR INPUT PATTERN FOR TOTAL DEFENSE

<u>Producing Industry</u>	<u>Quantity</u>	<u>Percentage</u>
Grain 000,000 mt	2.0	2.2
Meat 000,000 mt	0.5	11.6
Fats and oils 000 mt	30	1.5
Cotton 000 mt	50	5.2
Wool 000 mt	5	5.9
Hemp 000 mt	20	10.7
Electric power 000,000,000 kwh	4.0	3.2
Coal 000,000 mt		
Petroleum 000,000 mt	4.0	9.6
Steel 000,000 mt	2.6	10.4
Copper 000 mt	60.0	20.0
Aluminum 000 mt	100	32.5
Rail transport 000,000,000 ton km		
Motor transport 000,000,000 ton km	2.2	7.0
Water transport 000,000,000 ton km		
Trucks 000-2 ton units		
Tractors 000-15 hp units	39	10.1
Locomotives units		
Rolling stock 000-2 axle units		
Refined benzol 000 mt	2.0	.8
Toluol 000 mt	19.5	25.6
Phenol 000 mt	5.5	10.6
Rubber 000 mt	45	16.3
Machine tools 000 units	18.4	19.0
Ball and roller bearings 000,000 units	30.6	28.4
Heavy motors and generators 000 kwh	735	20.8
Coal mining machinery units		
Electron tubes 000,000 US \$	36.9	70.9
Merchant shipbuilding 000 GRT		
Construction %		
Trade %	20.0	20.0
Producing industries, nec		
Households-labor 000 manyears	4350	4.9
Inventory depletions		
Imports		

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S-E-C-R-E-T

S-E-C-R-E-TVEHICLES

<u>Vehicle Type</u>	<u>Unit Weight</u>	<u>Ingot Steel lbs./lb.</u>	<u>Ingot Aluminum lbs./lb.</u>	<u>Ref. Copper lbs./lb.</u>	<u>Ref. Zinc lbs./lb.</u>	<u>Elec. Power kwh/lb.</u>	<u>Man- Power manhrs./lb.</u>
Passenger Cars	-	1.41	.005	.0147	.0134	.213	.0806
Jeeps	-	1.75	.005	.0177	.002	.213	.0806
Light Trucks	3/4 ton lxl4 cargo	1.2	.005	.0177	.002	.213	.0806
Medium Trucks	1½ and 2½ ton cargo	1.2	.005	.0177	.002	.213	.0806
Heavy Trucks	5-7 ton cargo	1.2	.005	.0177	.002	.213	.0806
Tractors, track laying	-	1.5	.0016	.0062	neg.	.240	.125

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S-E-C-R-E-T

S-E-C-R-E-TAMMUNITION

Type Ammo.	Weight lbs.	Ingot Steel lbs./lb.	Ingot Alum. lbs./lb.	Ref. Copper lbs./lb.	Ref. Zinc lbs/lb.	Elec. Power kwh/lb.	Mun Power mh/lb.
Small Arms Ammo.	0.15	0.7	neg.	.050	.0005	2.5	0.17
Artillery Ammo-- Light	4.52	0.5	.006	.330	.125	3.32	1.1
Artillery Ammo-- Medium	42.0	0.75	.025	.410	.160	1.1	0.26
Artillery Ammo-- Heavy	150.0	1.60	.015	.200	.075	0.36	0.08
Mortar Ammo	35.30	1.0	.025	.0024	.001	0.35	0.14
Bomb-Aircraft	865.0	0.625	.002	.0007	.0003	0.37	0.21
Grenades	2.0	1.13	.001	.0005	.0002	0.30	0.03
Mines	13.0	None	.001	neg.	neg.	0.1	0.03
Naval Ammo-Light	4.52	0.5	.006	.330	.125	3.32	1.1
Naval Ammo-Heavy	425.0	0.75	.005	.225	.025	3.32	1.1
Aircraft Ammo.	1.0	0.7	neg.	.015	.006	2.5	0.2
Naval Torpedoes	2,820.	0.993	.027	.131	.036	.709	.709
Naval Mines	960.	0.521	.031	.052	.005	.521	.365
Submarine Battery	309.	neg.	neg.	neg.	neg.	.037	.012

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S-E-C-R-E-T

S-E-C-R-E-TAIRCRAFT AND AIRCRAFT ENGINES

Airplane Type	Air-frame Weight lbs.	Ingot Steel lbs/lb.	Ingot Alum. lbs/lb.	Copper lbs/lb.	Zinc lbs/lb.	kwh/lb.	Total Man Power mh/lb.
Jet fighter	5,100	0.84	1.03	.018	.0002	0.95	4.2
Jet light bomber	16,800	0.75	1.01	.024	.0012	1.14	4.9
Piston light bomber	8,700	0.75	1.01	.024	.0012	1.14	6.5
Medium bomber	48,000	0.75	1.01	.024	.0012	1.14	3.3
Heavy bomber	63,300	0.75	1.01	.024	.0012	1.14	2.3
Transport	17,200	0.24	1.53	.063	.0010	1.14	3.9
Reconnaissance	19,300	0.75	1.01	.024	.0012	1.14	3.2
Engines:	Jet	2,000	3.27	.76	.0035	.0005	2.57
	Air Cooled	2,300	3.70	1.20	.0054	.0004	2.57
	Liquid Cooled	6,000	3.67	.98	.0061	.0003	2.57
Aggregates:							
Aircraft		0.80	1.02	.0023	.0010	1.14	4.0
Engines		3.54	1.00	.0050	.0004	2.57	5.6

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S-E-C-R-E-T

S-E-C-R-E-TTANKS AND SELF PROPELLED GUNS

Item	Unit Weight lbs.	Ingot Steel lbs./lb.	Ingot Alum. lbs./lb.	Ref. Copper lbs./lb.	Ref. Zinc lbs./lb.	Elec. Power kwh/lb.	Man Power Direct & Indirect Man hrs/lb
Medium Tank - T54	85,800	1.323	.015	.011	.001	.466	.052
Heavy Tank - JSIII	112,200	1.323	.011	.011	.001	.534	.073
Medium Assault Gun - SU 100	59,400	1.323	.021	.011	.001	.673	.070
Heavy Assault Gun - JSU 152	99,000	1.323	.013	.011	.001	.606	.080
Field Rockets - 132 mm & 300 mm.	148	0.993	.010	.007 ^{1/}	.004 ^{2/}	.41	.108

1/ Pig Copper2/ Pig Zinc

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NAVAL AND MERCHANT VESSELS

	Ave. Std. Displ. Ton	Ingot Steel 1/ Tons/ton	Ingot Aluminum 2/ Tons/ton	Copper Tons/ton	Zinc Tons/ton	Elec Power KWH/ton	Manpower Manhours/ ton
Naval Vessels							
Battleship	30,000	1.422	.004	.020	.004	2200	658
Heavy cruiser	15,000	1.480	.007	.056	.005	3000	790
Light cruiser	11,200	1.839	.014	.057	.006	1120	992
Destroyer	2,500	1.960	.022	.098	.012	3200	1152
Submarine-large	1,500	1.527	.011	.092	.012	3300	1414
Submarine-medium	800	1.612	.011	.106	.013	3400	1.563
Submarine-small	200	1.500	.015	.065	.015	3500	1600
Ocean escort	950	1.583	.004	.061	.001	3200	1276
Patrol craft	300	2.500	.013	.053	neg.	3000	1147
PT boat	40	1.625	.225	.125	neg.	700	2250
Mine craft	600	1.383	.013	.097	.012	750	1142
Merchant Vessels							
Oceangoing							
Passenger & Cargo	3,500	0.943	neg.	.097	.002	544	786
Tankers	4,000	0.760	neg.	.078	.002	439	500
Harbor craft							
Self-propelled	300	1.267	neg.	.013	.003	800	933
Nonself-propelled	1,000	0.690	neg.	neg.	neg.	347	307
River craft							
Self-propelled	120	1.583	neg.	neg.	neg.	892	933
Nonself-propelled	500	0.680	neg.	neg.	neg.	348	308
Fishing craft							
All types	30	1.333	neg.	neg.	neg.	666	800

1/ Assumes 0.72 of ingot converted to plates, shapes, etc.

2/ Assumes 0.75 of ingot converted to plates, shapes, etc.

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PART V

OPERATION OF SOVIET BLOC ECONOMY

UNDER HOT WAR CONDITIONS

- A. The War
 - 1. General description
 - 2. Timing and locale
 - 3. Commitment of forces
 - 4. Opposition
 - 5. Materiel and equipment requirements
 - 6. Manpower requirements
- B. Resource Requirements
 - 1. Direct military sector requirements
 - 2. Indirect military sector requirements
 - 3. Hot and cold war requirements
- C. Sector Capabilities
 - 1. General
 - 2. Agriculture
 - 3. Textiles
 - 4. Energy
 - 5. Metals
 - 6. Chemicals
 - 7. Transportation equipment
 - 8. Machinery
 - 9. Transportation
 - 10. Construction
 - 11. Household sector
 - 12. Military sector

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S-E-C-R-E-T

S-E-C-R-E-T
Security Information

PART VI

ECONOMIC CAPABILITIES OF THE SOVIET BLOC

TO SUPPORT A GENERAL WAR

- A. Overall Economic Capabilities
 - 1. General
 - 2. Sectors of strength
 - 3. Sectors of weakness
 - 4. Balance
- B. Relaxation of Assumption
 - 1. Different hot war
 - 2. Different opposition
 - 3. Drawing down military inventory
- C. Summary of Economic Capabilities Estimates

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